

Smile Design Enhanced with Porcelain Veneers

By Dean C. Vafiadis, DDS

Part 1 of this series on smile design gave an overview of the many facets involved in beautifying smiles by design and the many ways of interpreting what is normal or ideal. Our first article discussed the role of the dentist as diagnostician, artist and scientist in meeting you the patient to decide the best course of action for your particular situation. A detailed analysis of your smile is critical to the correct assessment and the appropriate procedures for change or enhancement.

Porcelain laminate veneers are among the most esthetic means of creating a more pleasing and beautiful smile.

Porcelain veneers within reason allow for the alteration of tooth position, shape, size and color. They require a minimal amount of tooth preparation – in this case reduction (approximately 0.5 mm of surface enamel) – and are, therefore, a more conservative restoration than a crown, which requires significant removal of sound tooth structure. Although not the only alternative for all esthetic abnormalities, they are truly a remarkable restoration when they are the treatment of choice.

WHAT IS A VENEER?

Simply stated, a veneer is a thin covering over another surface. In dentistry a veneer is a thin layer of dental restorative material, usually porcelain that replaces enamel.

Porcelain was named after its resemblance to the white, shiny Venus-shell, called in Old Italian “porcella”. The curved shape of the upper surface of the Venus-shell resembles the curve of a pig’s back (from the Latin porcella - a little pig). Properties associated with porcelain are high strength, hardness, glassiness, high durability, translucence and high resistance to chemical attack.

Dental porcelain is a type used by dental technicians to create bio-compatible life-like crowns and bridges for dentistry. As you will note from the cases shown, dental porcelains in the right hands can make for spectacular tooth imitations by mimicking tooth enamel perfectly. This is also a testament to the artistic skill of the laboratory technicians with whom the dentist partners in producing life-like precision veneers to create your enhanced smile. The dentist will usually specify a shade of porcelain, corresponding to a set of mixtures in the laboratory containing the porcelain powder. The powder corresponding to the basic tooth color is mixed with water, and then placed in an oven for “firing.” Further layers of porcelain are built up to mimic the natural translucency of the enamel of the tooth.



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Figure 1: Original smile before veneers



Figure 2: Smile after "Hollywood White" veneers



Figure 3: Portrait photo after "Hollywood White" veneers

A laminate is a material constructed by uniting two or more layers of material together in a process called lamination (in common parlance, lamination refers to sandwiching an object or material between layers of plastic and sealing them with heat and/or pressure, usually with an adhesive). The laminate structure refers to the combination of tooth, bonding interface and veneer complex. The veneer shell replacing the removed tooth enamel is chemically bonded to the underlying tooth surface with which it becomes part.

Before a patient can successfully receive veneer treatment, certain aspects related to his or her dental health and tooth structure must exist, verified by a smile analysis:

- The teeth are in more or less normal position;
- Sufficient tooth structure needed for veneers exists;
- Symmetrical gingival (gum) contours are present, which allow for the proper "framing" of the teeth necessary for a beautiful cosmetic result [Fig. 1,2 and 3].

What veneers can do – porcelain veneers are an excellent solution for correcting small or medium spaces between teeth, imperfections in tooth position (e.g., slight rotations), poor color, poor shape or contours, as well as some minor occlusal (bite) related problems. Porcelain veneers can allow for dramatic improvements for patients who have worn their teeth by bruxism (grinding of one's teeth through habit patterns) or fractured teeth [Fig. 4,5 and 6].

What veneers can't do – in considering the limitations of porcelain veneers, we should be reminded of another important definition of "veneer" – a deceptive, superficial show or a façade. So too, there are situations that the technique cannot correct, such as poor tooth position, large discrepancies in root position, poor bite relations and poor profile.

Many of these situations first require some form of orthodontics to move the teeth into proper position – for both function and aesthetics. This important diagnostic determination is critical and defines the "brilliance" of your dentist. Porcelain veneers are an excellent form of tooth restoration, but as with any material used in the mouth, it does have limitations. There is no substitute for your dentist's expertise and consideration

of your specific needs obtained from his or her diagnostic evaluation – they are critical to assure the successful result of a beautiful smile.

SMILE ANALYSIS

After a traditional dental exam has verified the health of all underlying structures, the dentist begins a smile analysis, using facial measurement formulae relating teeth to the face and other techniques to customize the appropriate sized teeth to each specific individual.



Figure 7: A mock-up smile of tooth colored (white) wax

A computer imaging process is used to digitally replicate the patient's smile and then fabricate a mock-up smile made of tooth-colored (white) wax [Fig. 7]. This is used to make the provisional teeth after the diagnostic visit.

Provisional teeth are often used and are a benefit to patients because they can be worn for up to two weeks, creating, in effect, a "trial smile" – one of the rare instances in medicine or surgery where we can view and evaluate changes before the final result.

The provisional stage gives patients the exciting prospect of becoming full partners with their dentist in choosing from available colors and shapes. Patients interact with their dentists through feedback and information before deciding upon the final restorations that a gifted technician will exactly replicate in the porcelain veneers.

Now here's where the art in dentistry is really important. Your dentist and dental technician must carefully chose the right color for the porcelain veneers, As you will note this is complex:

Typical colors of natural teeth have three basic dimensions:

- hue, the color tone – red, blue or yellow;
- chroma, the intensity of color or saturation of the hue; and
- value, the relative darkness or lightness of the hue.

However, when looked at three-dimensionally, teeth have a variety of these combinations.



Figure 4: Original smile showing wear and shortened teeth



Figure 5: Establishing normal tooth length with veneers



Figure 6: Portrait photo showing "Enhanced White" veneers



Figure 8: Original smile before veneers



Figure 9: Smile with "Natural Color" veneers



Figure 10: Smile with "Enhanced White" veneers



Figure 11: Smile with "Hollywood White" veneers

When changing people's smiles, the patient has a choice of matching their existing tooth color known as "Natural Color." Patients can enhance their tooth color in two more ways; a much brighter "Enhanced White" color; or, like some celebrities, a dazzling version known as a "Hollywood White" color. Each of these colors usually has the same chroma and hue chosen by the dentist and the laboratory technician. The difference between these three enhanced smiles is the value of that chroma [Fig. 8, 9, 10, 11 and 12].

With the different shade guide that are created by the porcelain companies, the dentist or the lab technician can blend the shade and color that best represents the patient's expectations [Fig. 13]. The technician will choose several different colors and textures to mimic an existing tooth color or create a new brilliant color that the patient and the doctor have agreed on.

Since most of the tooth is still remaining after preparation, the veneer will act like a "contact lens" and transmit the original color of the tooth, and then be enhanced with the colors the technician baked into the porcelain.



Figure 12: Portrait photo showing "Enhanced White" veneers

SOME FACTS YOU SHOULD KNOW ABOUT PORCELAIN VENEERS

- Since they require approximately 0.5 mm of tooth reduction, porcelain veneers are not considered a reversible form of treatment.
- Occasionally, the preparation of a porcelain laminate veneer does not necessitate the use of a local anesthetic. However, for those patients that are particularly sensitive or anxious, a local anesthetic is advisable.
- The laboratory time required for the fabrication of a porcelain laminate veneer is approximately one week, although this may vary.
- You can expect some sensitivity to hot and cold. This is normal and is due to the removal of a small portion of the tooth's enamel covering. This sensitivity should disappear a few days after the placement of the veneers.
- The insertion or cementation of your laminate veneers can be accomplished once again with or without local anesthetic. This visit is usually longer in length. The laminates are placed with a light-sensitive resin hardened with the use of a white light, effectively bonding them to your teeth.
- Once placed your laminate veneers are very strong and will resist most of the forces placed upon them by a normal diet. Porcelain is a glass and like glass it is strong, but brittle. Therefore, you should avoid anything that will tend to stress the laminate veneer. Opening pistachio nuts with your teeth, chewing on bones or candy apples is probably not a good idea. As with most things, common sense should prevail.

MAINTENANCE OF YOUR NEW PORCELAIN VENEERS

The maintenance of your porcelain laminate veneers is relatively simple. Here are some recommendations:

1. Brush and floss as you normally would to prevent dental problems. Porcelain veneers are one of the kindest restorations to gum tissues that we currently have in dentistry. Don't be afraid of damaging your laminates by either flossing or brushing. Any non-abrasive fluoride toothpaste is acceptable. A good home care regimen will insure the esthetic success of your laminate restorations for years to come.
2. If you are known to be a bruxer or clencher, i.e. you have a habit of grinding your teeth, please let your dentist know. He or she will fabricate a protective "occlusal" or bite guard for you to wear to minimize the stresses placed upon your teeth while you sleep.
3. Approximately one week after the placement of your laminates you will be asked to return to the office for a treatment evaluation. This visit is extremely important. It gives your dentist the opportunity to evaluate the placement of the laminates, the gum tissue response and to answer any questions you might have regarding your new smile. Regular maintenance and dental check ups are recommended so that your veneers and oral health can be reviewed periodically.

Once placed your laminate veneers are very strong and will resist most of the forces placed upon them by a normal diet.

Figure 13: Dentists use a shade guide to determine the best veneer color for a patient's teeth



Veneers have no higher incidence of decay provided they are properly cared for with regular flossing and brushing with toothpaste

FREQUENTLY ASKED QUESTIONS ABOUT VENEERS

1. What happens to my teeth after veneers, and will I ever get cavities?

The integrity of veneered teeth is only marginally compromised, and the veneer is bonded to the existing teeth. There is no higher incidence of decay provided the veneers are properly cared for as previously mentioned with regular flossing and brushing with toothpaste. Keep your sugar consumption low and confined to meal times, good dental advice generally to prevent decay.

2. How long will porcelain veneers last?

In my experience they can last from seven to twenty years. While the veneer itself is inert and non-living, the tooth or teeth to which they are attached and the surrounding gum tissues are living and may change. For example, gum line shrinkage may expose or reveal root surfaces. If a veneer comes off it can generally be rebonded. If it chips it can sometimes be rebonded or otherwise replaced.

3. If I have my upper teeth treated with porcelain veneers, will my lower teeth still be a different color, or more yellow?

This is certainly a factor that will be discussed during your evaluation and smile design so that everything matches and blends well. Most patients usually

whiten the lower teeth with whitening (bleaching) procedures to ensure a good match.

4. Do porcelain veneers stain with normal things like tea, coffee and wine?

Porcelain veneers should never stain; however, if your teeth have a propensity to stain you should try to avoid or minimize the behaviors that lead to staining and look after them as recommended above with normal hygiene and maintenance procedures.

5. Does dental insurance cover porcelain veneers?

Some insurance companies will cover up to 50% of the fee they deem customary. However, it depends upon what your employer has contracted for with your insurance company rather than what your dentist is charging. Don't forget your dentist also has to pay the dental technician who actually fabricates the veneers, a critical component in the fee.

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ABOUT THE AUTHOR



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Dr. Dean Vafiadis earned both his DDS degree and certificate in prosthodontics from New York University College of Dentistry, graduating as one of the youngest prosthodontists in New York City. He has served on the faculty at NYU Dental School since 1995, teaching prosthodontics and implantology, as well as serving on the NYU board of directors. A prolific career in teaching, lecturing and writing has gained him both national and international recognition. He has published an array of articles on implants and esthetics and has been a keynote speaker at such prestigious institutions as the Mayo Clinic and the Bethesda Naval Academy among others. He is professionally affiliated with numerous dental organizations and is actively involved in teaching dental professionals throughout the tri-state area.

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The artist behind the veneer

An ode and testament to the dental technician....

“Good dental porcelains in the right hands can make for spectacular tooth imitations by mimicking tooth enamel perfectly”

Those hands belong to a talented group of artisans, dental laboratory technicians who are highly trained professionals in their own rights, certified and licensed under state jurisdiction. They perform the technically sophisticated and artistic tasks necessary for the fabrication and production of veneers, crowns and many other procedures that result in the exact mimicry of natural teeth, both in form and function. The partnership between dentists and dental technicians is unique, these are the people that ultimately make you our patients look good and if you look good, we look good. The crucial elements of the relationship are threefold: excellent dentistry; excellent communication; excellent technical results.

EXCELLENT DENTISTRY:

The quality of the work your dentist does will have a direct bearing on the outcome of the work the dental technician can provide in return. For example, the dentist

will “prepare” your teeth by removing exactly the right and minimal amount of enamel to allow for excellent veneers. This requires a high degree of understanding and knowledge of the restorative materials, in this case the porcelains used, so that they are neither too thick nor thin, and which could adversely affect the fabrication of the veneers. This among other critical information must be accurately communicated to the dental technician. The technician likewise must fully understand the role of the dentist, the handling and management of the materials, the porcelains to fabricate the veneers.

EXCELLENT COMMUNICATION:

The transmission of precise information from dentist to technician is critical to fabrication of the veneers. It requires the provision of exact models of the prepared tooth forms, and information regarding the shades, colors and shapes of the teeth to be replicated. Communicating

the information is also quite sophisticated, often requiring color corrected lighting, cameras and computers, all necessary elements of the prescription for success.

EXCELLENT TECHNICAL RESULTS:

Empowered with these tools the technician can do his/her best to provide excellent results. Each element of this information will have a direct impact on the porcelain laminates to be made including how light will be both transmitted and reflected to give a natural effect. The end result; perfect fit, finish, visual and functional appeal of your new smile. What makes them excellent – nobody knows they’re veneers, the technician’s excellent work makes him/her invisible.

A little understood fact is that there is a price to be paid for the skills and art of technicians and the work they provide. Their services are contracted for by the dentist; generally speaking the greater the art, the higher the value. This is reflected in the value of the veneers, crowns or other services provided.

So as the great artist works with paint, brush and palette, the great chef with the freshest foods, ingredients and skills, so the dental technician understands both the science of the dental materials and the art in bringing them to life. The dentist and dental technician truly have a hand in glove relationship in the service of you our patients.

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