Now that we are approaching 25 years experience with bonded porcelain veneers, we really know a lot about them. We know what prep results in the strongest veneers, we know how strong they really are and we know that they can last for a very long time.

Clinical

Porcelain veneers 20 years later

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Veneers at 14 year recall.



Veneers at 21 year recall.



Veneer chipped by trauma.



Successful repair, 6 years later

The biggest clinical problem I have encountered with veneers is the try-in materials. I have avoided the use of try-in pastes for two reasons. First, glycerin based try-in pastes are generally very poor representations of the final composite shades. Some brands are better than others, but most are terrible. Second, glycerin based try-in pastes are sources of veneer contamination. Unless thoroughly removed, they will weaken the bond strength of composite to the HF etched porcelain veneers and can often result in a complete de-bond. Now there is a revolutionary try-in system that allows us to dial-in the shade, eliminating the try-in problems.

Longevity of veneers

I have personally placed thousands of porcelain veneers since I was introduced to the concept¹ by Dr. John Calamia in 1983. So how long do veneers last? In my practice, a very long time, at least as long as crowns. The most common reason for replacement is gingival recession, mostly after 10 years of service. The second most common reason is the patient wanting to upgrade to even whiter veneers. (Ten years ago, shade A2 was normal. Now it's whiter than B1.) Fracture has been rare and de-bonding non-existent. I estimate that the rate of fracture is around 2% at 10 years. Fracture most often occurs at the incisal edge, from trauma, or at the cervical area when the veneer is bonded to dentin, presumably from tooth flexure. This result compares favorably to all-porcelain crowns and PFM crowns.

Here are two representative long-term veneer recalls. One is 21 years recall and the other one 14 years. The 14 year case (shade A2) is holding just fine but the older one showed excessive gingival recession and the veneers were consequently replaced. Since the veneer preps were only in enamel, removal and remake was done without anesthesia. The third picture is a porcelain veneer that was chipped by bumping with a Coke bottle after 9 years of service. Fortunately, sectional porcelain was able to repair this one and it's still looking good after 6 more years. (The procedure for bonding sectional porcelain has been in my seminars for years now; if you are not familiar with the technique let me know and I can e-mail it to you.)

Pressed ceramic vs. "feldspathic" veneers

More than 95% of my veneers are fabricated with "feldspathic" porcelain, that is from a porcelain slurry brushed onto foil or a refractory model and then fired. These feldspathic veneers are in contrast to what we call pressed ceramics. The most commonly used porcelains for my veneers are Ceramco 2, Noritake, d-Sign, and Finesse. (Some of these porcelains are not technically "feldspathic", since they are not made from the mineral feldspar. However they are fabricated like feldspathic ones.) The reason that I choose feldspathic veneers in that they can be made thinner than pressed ceramic with more than one color of porcelain throughout the veneer. Pressed ceramics rely on surface color to produce multi-hued veneers. Unfortunately if I grind the surface to reshape the veneer, as I often do, this surface color is lost. I reserve the use of pressed ceramic for veneers that are around 1 mm thick or more (say, a peg-shaped lateral incisor). The pressed ceramics seem to have a better chameleon quality for these thick veneers, very useful when a shape change but not a color change is desired. My veneers average 0.5 mm in the thickest places. That is roughly half of the enamel thickness, allowing the tooth preparation to be entirely in enamel. There are obvious advantages, including no need for anesthesia for the preparations nor for the bonding procedure. Pressed ceramics generally need a lot more tooth reduction.

So why are pressed ceramics seemingly more popular than feldspathics? I think it is due largely to commercially driven teaching institutes who are in cahoots with the pressed ceramic manufacturers. Another factor, as I am told, is that it is easier to train a technician to make pressed ceramic veneers than to make feldspathic veneers. Yet another factor may be that some dentists expect a veneer to be a lot like a crown, that is final in color when delivered, no matter how it is bonded. Only thick veneers can accomplish



to PV prep



Veneers on model, 2 shades of Accolade PV Try-in

Professor Bertolotti will be touring Australia in June & July 2006.

Sydney, Saturday June 17 Perth, Thursday, June 22 Surfer's Paradise, Saturday June 24 Melbourne Sunday, July 2

Contact: Ruth Port & Power 2B on Phone: (02) 9327-2576 or www.power2B.com.au this objective. However they rarely do; when was the last time you received a perfect single central incisor crown or thick veneer? Thin veneers are translucent and are meant to be "dialed-in" for color at chairside, something you can't do with thick veneers. I find the dial-in capability to be a great advantage, allowing me to match almost anything. With a single veneer, the final dial-in of a thin veneer is usually easy! All you need is the right veener bonding system and ideally a perfectly shaded try-in system.

Preferred tooth preparation

Fortunately we have some good research on tooth preparation. Castelnuevo et al.² found that 2 mm of free standing porcelain produced the strongest veneer and furthermore that a lingual chamfer actually reduced strength compared to a lingual butt joint. This is great news since it is easy to prepare for 2 mm of porcelain and a lingual butt joint. Just hack off some incisal tooth and leave the lingual margin as-cut. Just be sure to round the facial-incisal angle after you prepare the facial reduction. (Of course if the tooth is worn, you will need to reduce the incisal less that 2 mm since you are planning for 2 mm of porcelain.) The facial-incisal preparation allows for various paths of insertion and for extending into the gingival interproximal areas.

A very nice paper by Magne and Douglas³ stated "each subsequent reduction in tooth structure resulted in a substantial increase in crown flexibility, even after restoration" and "veneered incisors should be considered to be similar to natural teeth and restored accordingly." Let's consider what they are saying. The more tooth reduction, the more the restored tooth will flex. We definitely don't want the tooth to flex since that potentially results in cracked porcelain. In their paper, they show that even a small fraction of remaining enamel will substantially stiffen the restoration compared to total enamel removal. With roughly 1 mm of facial enamel available on a typical incisor, that means a typical prep for pressed ceramic would remove all the enamel. By contrast, about half the enamel need be removed for a feldspathic veneer. So it makes a lot of sense to conserve some enamel for reasons of strength, never mind the other obvious advantages of being in enamel. Note also their last statement, concerning strength. Hence, I do not provide night guards for reason of preventing fracture of the veneers since the veneered teeth should be "similar to natural teeth".

Revolutionary try-in system

For the reasons mentioned above and as many of you know, I have historically avoided the use of try-in pastes. Instead I have used the real composite for tryin. This procedure limits the try-in time and sometimes does not allow enough time for the patient to "buy the shade". It seems like every time I hear about a total veneer debond (I have had none, that's zero!!), there is some try-in paste issue to blame.

Well, Danville's innovation to the rescue! Danville just introduced a revolutionary try-in composite, called Accolade PV Try-in. Since it is a composite, it matches the Accolade PV veneer bonding composite. The difference is that the Try-in version has drastically reduced amounts of light sensitive catalysts whereas the bonding composite has the customary amount of catalyst. After try-in, the Accolade PV Try-in composite need not be completely removed. It will polymerize when it comes in contact with the fully catalyzed Accolade PV composite. Awesome!! No more glycerin contamination issues. No more off color try-ins. Plenty of try-in time.

The Accolade PV shades were developed in consultation with Dr. Tom Hughes. Dr. Hughes is one of America's greatest cosmetic dentists. Many of you know Tom from the Smile after Smile albums. (They are now sold by Smart Practice.) Tom found, as I confirmed, that only 3 shades of composite will suffice for dialing-in most feldspathic veneers. (These shades are Translucent, Light, and Extra Light.) Yours truly designed the two "darkening" shades, Yellow and Brown, which are not used as often as the other 3 shades but sure are handy when you need them. It is most interesting to note that DaVinci lab (famous for great feldspathic veneers) has a veneer bonding kit with nearly the same shades. They call theirs Bright, Brighter, Brightest and finally Ludicrous Bright. The equivalent ludicrous shade is also in the Accolade PV kit, called White Opaquer, a shade that I think would not be used by itself. It was designed as a blending shade and for pre-impression "block-out" of heavy tetracycline cases.

The new veneer plan and cooperating labs

So here is the new veneer plan: Specify to the lab the final shade desired, the prep shade (often Ivoclar/ Vivadent's "Die Stumpf" guide is handy for this one) and provide quality impressions. That is all they will need. The lab can recommend the proper shade of Accolade PV composite, based on the in-lab try-in on a tooth colored replica. That is the biggest simplification ever in doing veneers!!

The shade taking and lab try-in procedures are illustrated left.

References

- Calamia JR, Etched Porcelain Facial Veneers, NYJ Dentistry 1983; 53:255-259.
- Fracture load and mode of failure of ceramic veneers with different preparations. Castelnuevo et al, J Pros Dent 2000;83:171-180. (reprinted in Feb 2004 California Dental Assn Journal, pages 167-177.)
- Magne P and Douglas W, Cumulative effects of successive restorative procedures on anterior crown flexure: intact vs. veneered incisors, Quint Inter. 2000,31:5-18.

You can purchase the Accolade PV kit from Amalgadent Dental Supplies in Australia Toll-Free phone: 1-800-806-450.

Share ideas with dentists around Australia: www.dentaled.com.au