

The Importance of Cementation: A Veneers Case Using A New Universal Cement

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Introduction

Esthetic options in dentistry are the prevailing choice of most patients today. Veneers and bleaching in particular have become buzzwords in popular culture, and TV sitcoms, film and magazine advertising have turned these cosmetic techniques into household names. As a result, dental teams must accommodate the demands of their patients, becoming highly versed in placing metal-free restorations.

Practitioners can find a multitude of educational articles and courses teaching the science and technology of porcelain, zirconia and composite. But while emphasis is frequently placed on the final prosthesis or direct restoration, often overlooked are the increasingly important auxiliary materials that contribute equally to the clinical success of these new materials and restorations: impression and provisional materials, bonding agents and cements. Education is imperative because cementation and bonding are two areas of esthetic dentistry that have evolved through generations of products and techniques.¹ These processes are essential in making esthetic restorations both functional and comfortable.

That's why veneering can be an optimal, conservative alternative to crowning teeth, since preservation of tooth structure is important to dentists and patients alike. The

highly esthetic results are due to the fact that ceramics have a translucent finished surface texture similar to that of natural enamel.² Dentists, assistants and lab technicians spend vast amounts of time and effort perfecting veneers and avoiding fracture through painstaking preparation, material and shade selection, fit and fabrication. Yet even after such arduous processes, clinical failure and patient dissatisfaction can readily occur with errors in cementation.

Cementing veneers is a delicate process with a historical litany of potential problems – color instability, insertion difficulty, handling and cleanup issues, unsatisfactory radiopacity, low translucency after curing, mismatch between try-in gels and final cements, and debonding, to name a few. Cement selection in certain applications necessitates knowledge of the chemistry and physical properties of the particular cement type, and insertion requires an exacting technique for successful clinical results.³

This article outlines a veneer case using NX3 Nexus[®] Third Generation—a new, universal cement from Kerr. The subject is a long-standing patient-of-record with a current radiological and medical chart. This focus is on the steps and techniques implemented at final cementation of the prostheses.

Clinical Case

A female patient in her mid-fifties presented a chief complaint of being unhappy with her smile. An examination of her hard tissues revealed immediate concerns of multiple fractures, hypocalcification, shortened anterior teeth due to wear and an asymmetrical smile line (Figures 1 and 2).



Fig. 1



Fig. 2

After proposing a first phase treatment plan to restore all of her compromised upper anterior teeth, the patient consented to restoring only teeth numbers 6-11. The patient ultimately qualified for and accepted veneers as the mode of indirect restorative treatment.

Prior to preparation, the tissue around tooth No. 8 was recontoured. Then, the teeth were prepared for pressed ceramic veneers and provisionalized in the standard manner. Occlusal analysis and adjustments were performed over a period of weeks and the veneers were tried-in. After the requisite steps were completed preceding insertion and the veneers were finalized, the provisionals were removed and the teeth were cleaned (Figure 3).



Fig. 3

Expasyl™ was used for gingival retraction and hemostasis in order to gain cervical access and control bleeding in that area (Figure 4).



Fig. 4

The teeth were then etched for 15 seconds with Kerr Gel Etchant, which is composed of 37.5% phosphoric acid (Figure 5), and then rinsed and slightly air-dried. (Note: While a total-etch technique was used, NX3 works with both total-etch and self-etch protocols, adding to the distinctiveness of the product.) Per manufacturer directions, OptiBond Solo™ Plus (Kerr) was brushed onto the tooth surfaces for 15 seconds (Figure 6), air-thinned for 3 seconds, and cured for 10 seconds using the L.E. Demetron II curing light (Kerr) (Figures 7 and 8).



Fig. 5



Fig. 6

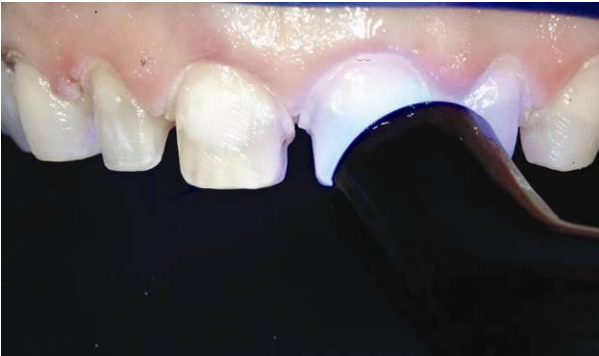


Fig. 7



Fig. 8

After etching and bonding, the veneers were cemented using NX3 light-cure cement in the clear shade (Figure 9). The cement was dispensed directly onto the internal surface of the veneer and was expected to ooze from all margins when the veneers were placed onto the prepared teeth. With the choice of either the single-syringe light-cure veneer cement or the dual-syringe dual-cure resin, the light-cure method was used because the veneers were not inordinately thick. NX3 allows veneers to be cemented all at once (as opposed to cementing centrals first, laterals second, and so on) because of its unique “thixotropic” properties, which enable them to stay where they are placed prior to light-curing. This feature makes adjustments and proper placement easier while decreasing the

need to adjust the veneers interproximally if space is needed once they are cured.



Fig. 9

Prior to final curing, the restorations were spot-cured for several seconds to allow the excess cement to be cleaned (Figure 10). The veneers then were light-cured for 40 seconds per surface (Figure 11). (Note: Manufacturer instructions allow for 10-second cures with the L.E. Demetron II. In this case, however, the doctor’s discretionary use was 20-second cure times.) Occlusion was adjusted using a fine diamond bur and the lingual aspects of the teeth were finished and polished using CeraGlaze® Porcelain Polishing System (Axis Dental), rendering a very satisfied patient (Figures 12 and 13).



Fig. 10



Fig. 11



Fig. 12



Fig. 13

Conclusion

Cementation is an important aspect of functional aesthetics. An understanding of chemistry, technology and physical properties are all essential to proper usage and clinical success. Cement selection was the driving factor in choosing the bonding system for this case. NX3 Nexus[®] Third Generation cement is free of amines—organic compounds containing nitrogen as their key atoms—which were largely blamed for the colour shifts so prevalent with earlier cement formulations. In an earlier use of the product the cement proved to be “thixotropic,” the consistency of non-drip paint; the restorations were seated and adjusted before curing with no dripping or running. Color stability, ease-of-use and cleanup, color match and optimum retention are some of the attributes necessary when choosing a cement—NX3 met all of these expectations.

1. Kugel G, Ferrari M: The science of bonding: from first to sixth generation. *J Am Dent Assoc.* 2000 June;131 Suppl:20S-25S.
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3. Sheets C, Taniguchi T: Advantages and limitations in the use of porcelain veneer restorations. *J Prosthet Dent* 1990;64:406–411.