



Professional Resources

Clinical Findings Using A Self-Etching Primer

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Success in private practice can be achieved when dental practitioners find the balance of using each of the following three essential components: art, science, and business. The art component focuses on providing patients with beautiful and functional restorations. Regarding the science factor, practitioners must employ materials that have been developed according to sound scientific principles, which means they should be formulated to meet a specific set of clinical and case requirements. Additionally, the materials should demonstrate clinical success and be supported by thorough, scientifically documented laboratory and case studies. To achieve the equilibrium necessary in the business component for practice success, practitioners must deliver cost-effective restorations that satisfy the doctor and patient demands for aesthetics, function, and durability and obviate the need for replacement and/or further treatment.

Additionally, patient comfort is critical during and following all phases of treatment; it is a significant factor affecting all three components of practice success. Although comfort is a relative factor and quantitatively immeasurable, patients experiencing comfort during and following treatment may perceive the beauty and functionality of a restoration without knowing or understanding the science involved. Patient comfort also affects perceptions of the practitioners' abilities, which likewise affect the business component in terms of return visits and referrals.

Among the materials currently available that directly address the issue of patient comfort and facilitate the balance between the art, science, and business components of practice success is Clearfil SE Bond (J. Morita USA, Inc), a self-etching, light-cured bonding agent (Figure 1). This bonding agent is formulated to soothe dentin immediately upon contact and virtually eliminate postoperative sensitivity.



Figure 1

Self-Etching For Optimal Desensitization

Self-etching involves simultaneous total etching and priming of dentin and cut enamel. It is made possible by the use of primers that contain phosphate monomers. These monomers include an acid group that dissolves or converts the smear layer, subsequently penetrates the dentin tubules, and immediately begins sealing and desensitizing.

The amount of dentin decalcification is directly related to sealing and desensitizing. When dentin is etched with 32% phosphoric acid for 15 seconds, almost 300 ug/cm² of decalcification occurs, which relates to an etching depth of almost 8.1 um (Figure 2).¹ This exposes an entire collagen fiber network that can inhibit complete dentin sealing and result in postoperative sensitivity.

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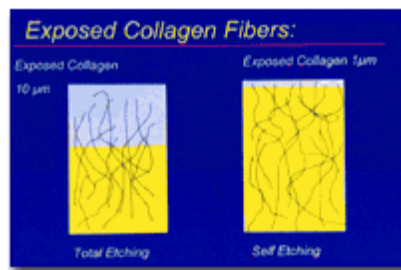


Figure 2

These data show that self-etching primers, which contain no phosphoric acid, decalcify dentin significantly less than various phosphoric acid etchants -- almost 1.0 μm versus 8.1 μm (Figure 3). As a result, fewer collagen fibers are exposed and, when used according to the manufacturer's directions, the resin is able to completely wet and seal the dentin, creating an effective seal and uniform hybrid layer. This eliminates postoperative sensitivity². When polymerized, self-etching primers are inert.

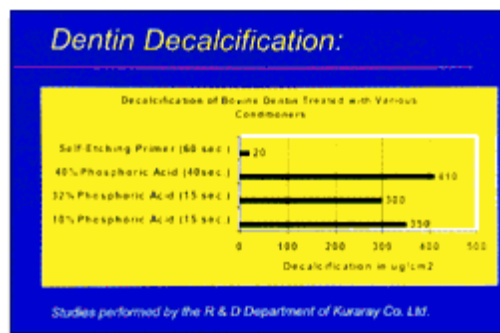


Figure 3

Self-etching systems are often referred to as 6th-generation bonding agents. Their development has logically followed more than 21 years of successful dentin adhesion using total-etch systems introduced by J. Morita and Kuraray Company in 1978.

The Clearfil SE Bond system incorporates SE Primer, a 20-second, selfetching formulation with a unique chemistry that soothes dentin and desensitizes immediately upon contact. It also features SE Bond, a 10% filled, light-cure adhesive with exceptional elasticity to relieve stress under light-cured composites, which eliminates or significantly reduces postoperative discomfort. The system creates a hybrid layer and requires no rinsing.

Clinically indicated for direct filling restorations using light-curing composites or compomers, the system is also ideal for desensitizing crown and bridge preparations and hypersensitive and/or exposed root surfaces; porcelain-fused-to-metal repairs; and silanating porcelain, hybrid ceramics, and cured composite resins. The bonding agent can also be used directly on pulpal tissue.³⁻⁵ The product has been tested and proven to provide the following clinical benefits:

- virtual total elimination of sensitivity;²
- significant reduction of clinical steps when compared to other so-called "single-component" systems;
- an increase in the bond strength of compomer restorative materials; and
- an ability to combine metal and porcelain bonding into a single step.

Application Technique

Figure 4 shows an unprepared tooth. Following initial preparation according to established protocols, caries detector dye was applied to verify removal of all carious tooth structure (Figure 5). When the final preparation was achieved (Figure 6), Clearfil SE Bond primer was applied (Figure 7) for 20 seconds, followed by SE Bond bonding liquid (Figure 8). The bonding liquid was then air thinned and light cured for 10 seconds. The final restoration is shown in Figure 9.



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9

Clinical Observations

In practice, Clearfil SE Bond provides a simple material for direct dental bonding that ensures patient comfort. The table documents actual use of the material in practice and records patients' subjective responses of postoperative discomfort. The restorative procedures involved in the cases consisted of using Clearfil SE Bond and Clearfil AP-X anterior/posterior hybrid composite resin. The hybrid composite resin is a light-cured radiopaque material formulated to provide accurate color matching, high polishability, and optimal consistency to facilitate handling and placement.

The 10 cases recorded in this chairside study involved 32 teeth restored according to the protocols established by the manufacturer for the specific materials employed. Of the 10 patients treated, four reported discomfort associated with biting pressure, and only one patient reported sensitivity to hot and cold stimuli. Of all the patients reporting sensitivity, only one case (patient No. 8) involved restoration replacement. In this case, the tooth exhibited a fracture that required a large restoration and could not be treated successfully with a direct restoration. Subsequent restoration consisted a crown.

Of the patients (Nos. 1, 4, and 9) who reported postoperative sensitivity, five, six, and four restorations were involved respectively. Patient No. 1 had a caries exposure that was quite large and subsequently required a root canal to relieve the symptoms. The other two patients exhibited biting sensitivity. In these cases, the occlusion was tested with articulating paper, and the bites were adjusted to alleviate hyperocclusion. The symptoms described by the patients resolved within 24 to 48 hours. Patients who reported no sensitivity to hot or cold stimuli or biting pressure underwent restoration of three or fewer teeth each. It is apparent that the greater the number of restorations involved in a specific case, the greater the potential for reports of relative discomfort, which may not, however, be related to the materials used but rather to the extensive nature of the treatment required. The occlusion schemes with a greater number of restorations are somewhat more difficult to check because of clinical factors of patient numbness and extent of the restorations.

Conclusion

Used according to the manufacturer's directions and following established restorative protocols, the self-etch bonding system provided significant desensitization to temperature on the restored teeth in nine out of 10 patients. Postoperative discomfort associated with biting pressure was completely resolved with occlusal adjustment. Although the number of cases treated and recorded for this preliminary study is limited, the effectiveness of the self-etch material is apparent. Thus, it is my opinion and belief that the self-etch bonding system meets the requirements needed to balance the art, science, and business of dentistry. This is accomplished by allowing for the delivery of successful, aesthetic, and functional restorations that result in patient satisfaction and comfort.

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Disclosure

Dr. Hoos has no financial interest in any of the products mentioned in this article and receives no financial support from any corporation.

[Chart: Clinical Observations of Patients Response to Stimuli Inducing Post-Operative Sensitivity](#)

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