A simplified aesthetic concept: part two

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Using a simplified placement technique
The method of restoring the prepared tooth has been the subject of considerable discussion. A myriad of restorative techniques have been developed to avoid the limitation of depth of cure, to reduce the effects of polymerisation shrinkage, improve marginal adaptation and seal (Dietschi et al, 1995; Lutz, Kull, 1980; Eick, Welch, 1986; Koenigsberg, Fuks, Grajower, 1989; Tjan, Berg, Lidner, 1992) to enhance aesthetic results (Tjan, Glancy, 1988; Kovarik, Ergle, 1993) and provide the clinician with maximum benefit for their application (Davidson, Felzer, 1997).

Several of the incremental stratification techniques include horizontal, vertical oblique, centripetal, three-sited light-cure, and centripetal build-up. These various methods are recommended according to the type and dimension of the cavity preparation (Terry, 2004).

While it is commonly believed that segmentally filling the preparation generates the least pull on the buccal and lingual cusps, not all literature agrees. In a study conducted at the University of Minnesota, Versluis et al (1996) demonstrated that bulk fill produced the least strain on the opposing cusps.

Although these stratification techniques allow the clinician to provide beautiful results, the use of intricate multi-layering with numerous shades of composite may not be efficient, realistic, or practical for the modern dental practice.

In an effort to simplify, improve efficiency and provide optimal aesthetics, a new nano-composite formulation was designed and integrated to the following duo-shade modified placement technique for posterior and anterior composite restorations.

Posterior restorations
For posterior restorations (Figures 1-6) this technique uses one continuous increment (ie, tubular shaped) that is placed and adapted in an oblique layer against the cavity wall with a round tipped composite instrument (PKT-3A, Brasseler, USA). The increment is cured through the cusp and the original cavity floor becomes part of the cavity walls. This process reduces the ratio of cavity volume to an area of the cavity walls, which results in a substantial reduction in the

Figure 1: Preoperative occlusal view of defective amalgam restorations with recurrent decay on maxillary first and second premolars.
eliminates all residual composite extended beyond the preparation but it also fills in any region that may have been somewhat underfilled.

Upon completion, the same burnishing instrument can be used to develop the central fissure, buccal and lingual developmental grooves and the incline planes. After light curing, the rubber dam is removed and an articulating paper is employed for the purpose of determining the existence of prematurities.

Anterior restorations

This same duo-shade placement technique can also be utilised in direct anterior composite restorations (Figures 7-

Figure 2a: After acid etching the enamel margins, a single component self-etch dentine adhesive was applied.

Figure 2b: The adhesive was then air-thinned and light-cured.

Figures 3a and 3b: A contoured sectional matrix band was placed. An A2 shaded flowable composite was applied as a cavity liner and uniformly distributed on the pulpal floor with a round tipped instrument.

marginal contraction gap (Hansen, 1986). A second elongated increment is adapted in the same oblique manner against the opposing cavity wall and light cured through the cusp.

For small- to medium-sized occlusal and a proximal cavity preparations, the internal dentine core requires two incremental placements. A final enamel layer is filled all the way to the occlusal margins. At this point, a round tipped instrument (such as the PKT-3A) is used to remove any residual composite material. Procedurally, the composite condenser is pressed against the occlusal surface. Using finger pressure, the instrument is used to trace the entire margin of the preparation. Such a technique not only eliminates all residual composite extended beyond the preparation but it also fills in any region that may have been somewhat underfilled.

Upon completion, the same burnishing instrument can be used to develop the central fissure, buccal and lingual developmental grooves and the incline planes. After light curing, the rubber dam is removed and an articulating paper is employed for the purpose of determining the existence of prematurities.
techniques to minimise the effects of shrinkage stress are minor.

We prefer to use a long bladed interproximal carver for placement and adaptation and a sable brush to smooth the surface. A curved instrument (TINL-R, Brasseler, USA) can be
used to shape the lingual surfaces of anterior restorations.

For class III and IV composite resin restorations, an opacious dentine increment is placed as the internal core and a second enamel layer encapsulates this core. For the class V, this same placement procedure can be utilised with a translucent or opacious dentine core, depending upon the colour of the substrate. For deeper cervical restorations, placement of the dentine core in two sequential increments allows for an overall stress reduction by allowing more yielding of the free surface of the restoration to the underlying contracting bulk. Placing the occlusal dentine segment with a higher bond strength to enamel first and then the gingival segment may reduce the potential for microgap at the gingival margin.

**Conclusion**

As we compare the old and the new in history, only time can provide the answers of knowledge, wisdom and truth.

Knowledge of a concept of the past and a desire to create are limited by the materials clinicians have available to them for restorative procedures. Advancements in composite resin technology continue to improve the practice of dentistry.

Continuing technological breakthroughs allow the clinician to not only comprehend the 'building blocks' of the ideal composite restoration, but also to implement and maximise the potential of new materials to attain more predictable and aesthetic results.

Since only the passage of time can provide the answer to the success of a material, future clinical trials will be required.
to determine the long-term benefits of Voco’s resin formulation.

The clinical examples provided in this article demonstrate the ability of this nanoparticle hybrid formulation to simulate the optical properties of the natural tooth.

References
Figure 12: The postoperative result achieved with this simplified two-layer nano-composite system reveals the natural integration of composite resin with tooth structure.


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