A technique for restoring Class V caries in primary canines

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This article describes a technique for restoring Class V carious lesions in the primary dentition. The discussion will include the treatment of aprismatic enamel in primary teeth, bonding to dentin, and the restorative techniques that are available for composite bonding. A case report is presented that utilizes several modern techniques for restoring Class V lesions.

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One of the major advances in dentistry during the past 30 years involves bonding to primary tooth enamel. Thirty years ago, dental schools taught that dentists could not bond to primary teeth because of the aprismatic (or non-prismatic) layer of the enamel surface. In fact, learning how to bond to primary tooth enamel has led to many types of esthetic restorations. The bonded restoration of primary incisors and canines is more difficult than that of corresponding permanent teeth because of the size of the teeth, the reduced amount of enamel present, and the aprismatic layer of enamel. However, dentists can overcome these factors and produce beautiful restorations. This article presents techniques currently available that allow dentists to restore Class V carious lesions in primary anterior teeth.

Aprismatic enamel
Preparing the aprismatic layer of enamel and etching the remaining enamel are important for bonding composite to the primary tooth enamel. Fortunately, this outer layer of enamel is very thin (approximately 25 µ). This layer of irregularly shaped enamel can be removed by swiping a fine diamond bur over the surface of the primary tooth. This can be accomplished without the use of anesthetic (Fig. 1).
Bonding to dentin

Although glass ionomers can be used on the dentinal surface, the author prefers resin-modified glass ionomers, such as Fuji II LC (GC America, Alsip, IL; 800.323.7063). These materials offer fluoride release, improved handling characteristics, biological acceptability, and superior bond strengths compared to glass ionomers. According to Suzuki and Jordan, the combined ionomer-composite restoration provides a reliable chemical bond to dentin, micromechanical bonding of the composite surface, and an acceptable esthetic result. Photocured glass ionomer/resin dental restorative materials were introduced in 1992. Their formulas include 80% glass ionomer combined with 20% visible light-polymerized resin material. These resin-modified glass ionomers were shown to have greater shear bond strengths than glass ionomers alone. These materials provide a method of bonding to dentin prior to placing stronger and more easily polished composites. This layering of two or more restorative materials (known as the sandwich technique) has been described previously in the literature.

Restoring Class V carious lesions

Many Class V carious lesions on primary teeth started as developmental pits on the surface of the tooth. Others are due to early childhood caries. After caries removal, a thin layer of resin-modified glass ionomer is placed over the exposed dentin and photocured (Fig. 2). A 37% phosphoric acid gel is placed on the entire labial surface for 15 seconds; at that point, the etched tooth is rinsed thoroughly for 10 seconds and air-dried. To prevent pooling of the resin, a thin coat of unfilled resin is placed over the entire surface and quickly air-dried. Next, a composite is placed into the preparation and a Cure-Thru matrix (Premier Dental Products, Plymouth Meeting, PA; 888.670.6106) is placed over the uncured composite (Fig. 3). The composite is cured and the matrix is removed. This plastic matrix allows for a smooth, polished surface with little excess composite to finish and polish.
Case report

A 6-year-old girl had severe facial caries on the primary maxillary canines (Fig. 4). No anesthetic was used and caries removal was accomplished using an Erbium, Chromium (Er, Cr):YSGG laser (Waterlase MD, Biolase, Irvine, CA; 888.424.6527) (Fig. 5). The total etch technique (utilizing 37% phosphoric acid gel) was employed on the entire facial surface of each tooth. The teeth were rinsed with water and dried; at that point, a bonding agent and composite were placed in the preparation (Fig. 6). The Cure-Thru matrix was used to contour the restoration prior to curing the composite (Fig. 3). Finishing and polishing were accomplished with carbide finishing burs (Brasseler No. 8.5 and No. 8392, Brasseler USA, Atlanta, GA; 800.841.4522) (Fig. 7) and sandpaper discs (Fig. 8). The completed restoration had a smooth and shiny appearance (Fig. 9).
Fig. 5. Left: The Waterlase MD is used to remove caries. Right: Final preparation of the Class V caries lesion.

Fig. 6. Composite is applied to the preparation.
Fig. 7. Finishing and polishing using two separate carbide burs.

Fig. 8. Composite is contoured with a sandpaper disc.
Discussion
The Er, Cr:YSGG laser was chosen as the mode of caries removal due to its ability to anesthetize the tooth, making local anesthetic unnecessary. The total etch technique was utilized to allow for maximum adhesion of the overlying bonding agent and composite materials. Composite resin was selected to allow for an esthetic restoration. The Cure-Thru matrix was used to obtain correct contour and reduce the need to finish or polish the final restoration.

Summary
Class V carious lesions are prevalent in primary teeth. Resin materials can be used to restore these teeth esthetically. The Er, Cr:YSGG laser can be used as an alternative treatment option for removing caries. A unique matrix can lead to an efficient and effective technique for placing esthetic restorations in the primary canines.

Disclaimer
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References
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