Noninvasive Caries Intervention Using Silver Diamine Fluoride

A pediatric dentist shares his experience using Centrix's silver diamine fluoride SilverSense SDF as a noninvasive caries intervention tool for a pediatric patient with dental phobia.

by Eyal Simchi, DMD

Dental treatment challenges are commonplace in an active pediatric dental practice, especially with children in the precooperative stage. This clinical case presents a quick, noninvasive caries intervention using SilverSense SDF™ (Centrix, Inc) to address early-stage caries in an uncooperative child due to dental phobia. It also demonstrates a far-reaching benefit for adults to prevent caries from progressing until the patient returns for restorative treatment.

Case Presentation and Diagnosis

During an initial exam of a 6-year-old boy, visual inspection revealed poor oral hygiene and gingivitis surrounding most teeth. Tactile exploration uncovered incipient decay on 2 partially erupted permanent first molars, teeth #3 and #14 (**Figures 1 and 2**). Given the poor state of oral hygiene, this patient presented with a high risk for progressive caries.

Communicating the Treatment Plan

The treatment plan presented to the child's parent emphasized the benefits of using a safe, noninvasive product, SilverSense SDF, to apply to the teeth and halt further growth of early tooth decay. As described to the parent, this procedure is a medicinal option for treating early decay compared with the more invasive treatment of drilling to remove decay in a newly erupted tooth.

The primary treatment advantages of silver diamine fluoride (SDF) are the silver's antibacterial effect, which halts decay progression, and the remineralization benefit of fluoride, which strengthens the tooth. The discussion also included photos of completed cases with SDF to show examples of the localized dark stain along a site-specific application area and offer reassurance that the color of the rest of the tooth remains unchanged. The parent was also told that local anesthetic injections were unnecessary, another key advantage to the proposed treatment. As standard operating procedure, the child's parent completed a consent form to initiate treatment.

Treatment Procedure

SilverSense SDF, which is 38% SDF, dispenses as a liquid with a blue tint to guide more precise application and avoid staining unintended surfaces. The 5-mL dropper bottle dispenses 30 µL one measured drop at a time. When preparing for treatment, a drop or 2 of SilverSense SDF is dispensed into a dappen dish, and a microfine applicator is made ready to dip and absorb the product. The SilverSense SDF Standard Kit includes a supply of 20 Benda® Micro Fine Applicators (Centrix, Inc).

The clinical application of SilverSense SDF is simple, quick, and easy. There is no need for drilling or abrasive tooth preparation. However, if the patient cooperates, we may clean the occlusal grooves with pumice. Each tooth receiving treatment must be dabbed dry with a cotton roll before applying the SilverSense SDF with the Benda Micro Fine Applicator. It is important to keep the carious area dry while the product is applied directly to that site alone. As the SDF infiltrates the incipient decay, the wait time is preferably 1 minute and largely depends on the patient's cooperative behavior. SilverSense SDF is absorbed quickly, and the site-specific application is reactionary and visible. It gradually changes to a darker color over time or immediately, as in this case (**Figures 3-5**).

Following the application of SilverSense SDF, a flavored fluoride varnish was applied to the treatment area, serving 2 purposes. First, the varnish does not wipe away quickly and provides an added protective layer of fluoride on top of the SilverSense SDF–treated site. Second, and importantly for the patient, the flavored fluoride varnish introduces a needed pleasant taste. If patients cannot tolerate the immediate use of a fluoride varnish, they enjoy a flavored xylitol lollipop to offset the metallic taste of SDF.

Workflow tips: A characteristic of SDF is that it will stain clothes, surfaces, or skin. Use gloves, face masks, plastic-lined tray covers, patient bibs, patient protective eyewear, and barrier protection on dental equipment that may come into

SilverSense SDF

This desensitizer is designed to reduce hypersensitivity and provide more comfort for the patient as they await restorative treatment, according to the manufacturer. It is formulated with 38% silver diamine fluoride, acting fast to harden softened dentin. This enables the clinician to place the restoration on top without being concerned about sensitivity. Because it is designed to be antimicrobial, clinicians can be confident in its placement prior to the finished restoration. It is also said to have remineralization properties. The material itself is tinted blue to ensure easy visibility. SilverSense SDF comes in 2 different package sizes: the Standard Kit, which contains a single bottle, and a Clinic Kit, which contains 3 bottles. The bottles are 5mL each. The dropper allows for more controlled dispensing; a single 30 µL drop is released at a time, which eliminates waste.

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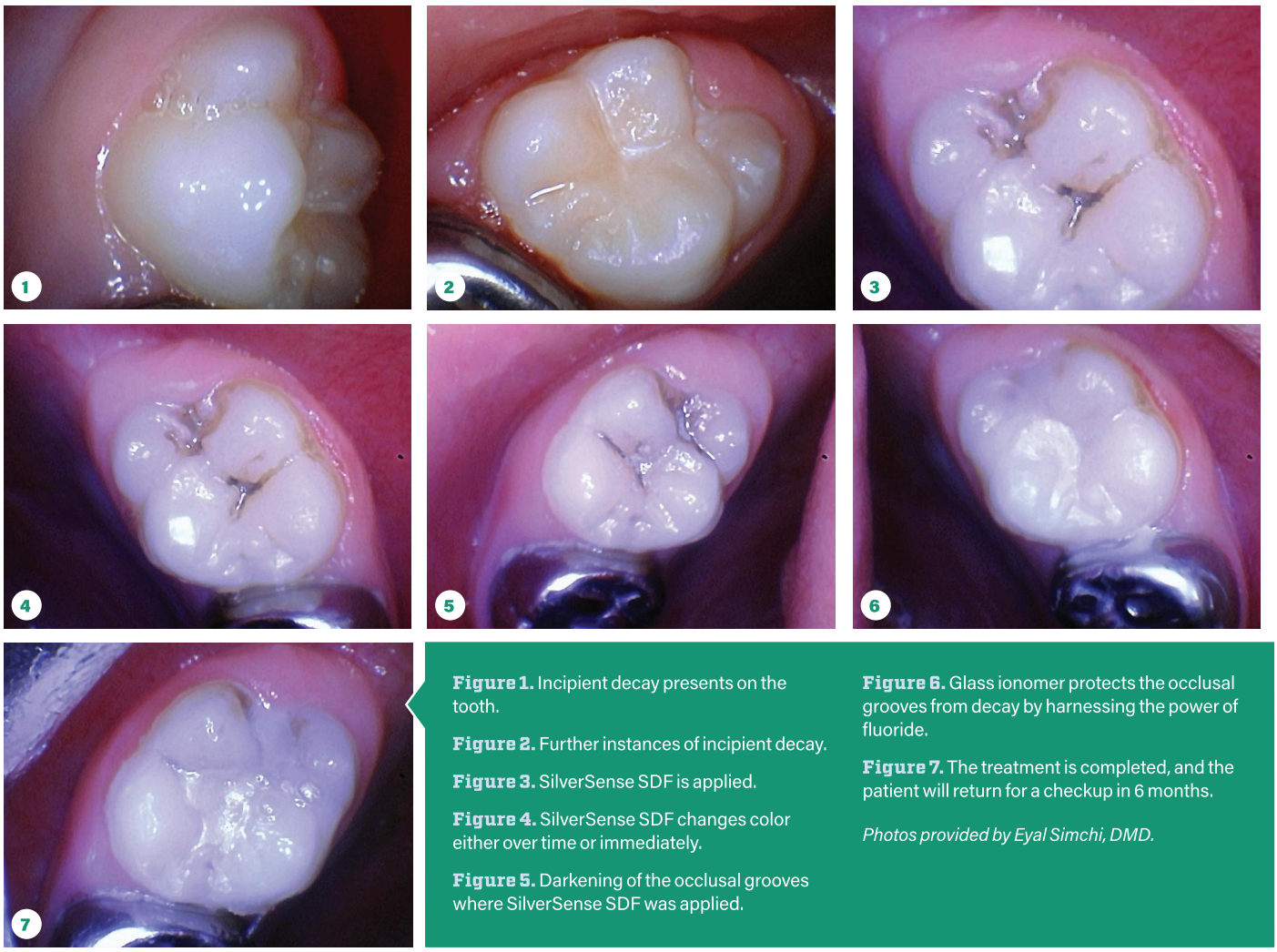

Figure 1. Incipient decay presents on the tooth.

Figure 2. Further instances of incipient decay.

Figure 3. SilverSense SDF is applied.

Figure 4. SilverSense SDF changes color either over time or immediately.

Figure 5. Darkening of the occlusal grooves where SilverSense SDF was applied.

Figure 6. Glass ionomer protects the occlusal grooves from decay by harnessing the power of fluoride.

Figure 7. The treatment is completed, and the patient will return for a checkup in 6 months.

Photos provided by Eyal Simchi, DMD.

contact with SDF. Applying petroleum jelly to the patient's lips and the skin surrounding the mouth protects the skin from stain due to inadvertent contact with SDF. It is helpful to avoid oversoaking the Benda Micro Fine Applicator with the product to prevent dripping before reaching the working area.

Workflow tips: SDF is a remarkable product with far-reaching advantages. However, flavor is not one of them. SDF has a metallic taste. As standard operating procedure, when introducing new dental materials into our patient care procedures, our doctors and staff try out the products to experience what the patient will experience. This assessment includes trying an SDF treatment and evaluating flavored fluoride varnishes and xylitol lollipops to discern the best flavors to override an SDF aftertaste and recommend to patients.

Return Visit for Follow-Up: 4-6 Weeks

Our standard SDF treatment protocol is a follow-up appointment within 4 to 6 weeks to assess if an additional application is needed. Visual and tactile inspection of the SilverSense SDF treatment site revealed it to be intact after 6 weeks. A glass ionomer cement was placed over the treated area on both partially erupted first molars, protecting the occlusal grooves from further decay and infusing the occlusal surfaces with the fluoride inherent in the glass ionomer cement (**Figures 6 and 7**).

Treatment decisions at these follow-up visits are made on a case-by-case basis. At times, SDF treatment may need to be applied a second or third time. Definitive treatment decisions depend on the tactile quality of the tooth surface. Despite precooperative challenges, the 6-year-old patient managed very well with this noninvasive treatment protocol to halt decay. These newly erupted permanent first molars were spared a drill-and-fill procedure, and the incipient decay was stabilized. Treatment is complete, and the patient will return for a regular checkup in 6 months. ●