

SEALANTS

The dilemma of “hidden” caries under narrow grooves poses a challenge for the clinician who places pit and fissure sealants. At Children’s Dentistry we feel strongly about not placing sealants over caries. When sealants are placed in the traditional manner, that is with a prophyl followed by acid etch and an unfilled sealant, sealant loss has been documented in numerous studies to be 5-10% a year. Caries under either an intact or partially lost sealant is a common clinical finding; sometimes the caries is substantial. This experience has led us to utilize an enameloplasty before every sealant. Our success rate has greatly increased since we began opening the grooves and placing composite, similar to a preventive resin restoration.

In 1999, Betty and a colleague surveyed pediatric dentists in six populous states, including Colorado, and all 52 U.S. dental schools about sealant use and placement techniques. Their article “Sealant use and placement techniques among pediatric dentists” was published in JADA, Vol.132, Oct. 2001. They found that 87% of the respondents performed surface preparation using either air abrasion, or a slow or high speed handpiece. 33% used a rubber dam for isolation while the remainder used either saliva ejectors or cotton rolls. Opaque sealants were used by 64% of the schools and 45% of the practitioners. Fluoride releasing sealants were the next most popular as were flowable composites. The data clearly demonstrated that sealant use among pediatric dentists was evolving toward the increased use of surface preparation and filled sealants, combining a restorative procedure with a preventive philosophy.

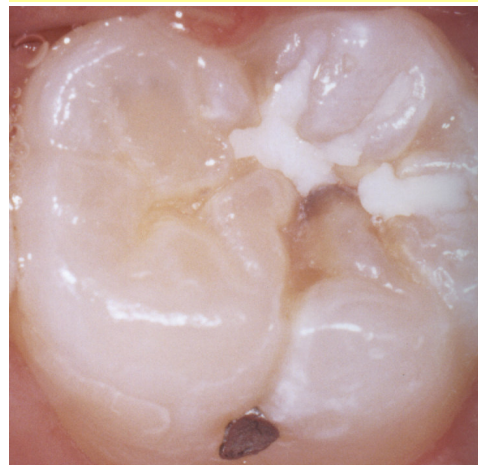
Our Technique

After a careful clinical and radiographic evaluation, the decision to place a sealant is based on the caries risk of the child and the potential for routine follow-up. If we suspect that the child will not be seen at regular intervals, we will either recommend no sealant or a conservative C1 I restoration.

For the last 10 years or so, we have used a ¼ or ½ round bur or a fissurotomy bur on the high speed handpiece to open and explore the fissures. We are continually surprised by dentin caries, especially in second molars. Even when the grooves are caries-free, we do an enameloplasty in order to increase the surface area for bonding and to be able to place a filled composite for better retention and longevity.

We use a rubber dam on approximately 95% of our sealants. Studies demonstrate that sealants placed on partially erupted molars fail in 50% of the teeth so we believe that the rubber dam gives us the best chance of good isolation and moisture

Failed Sealant



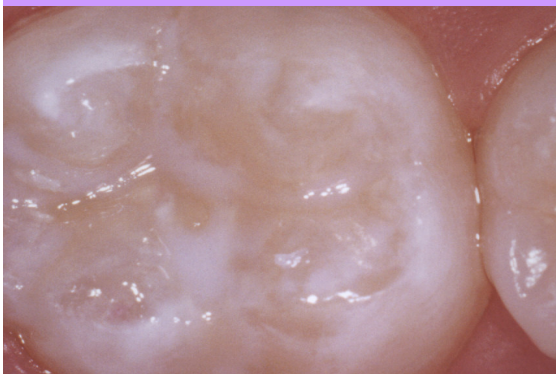
After the enameloplasty, the tooth is cleaned with 3% hydrogen peroxide. The tooth is etched for 15 seconds, followed by a 10 - 15 second wash. The surface is air dried. The bond is brushed on, cured and Z250 is packed in the grooves and cured. The surface is polished and the rubber dam is removed. The occlusion is adjusted if necessary using finishing burs.

This procedure is not as fast as the traditional placement but we have found that it is worth the time and effort. Our success rate is much higher than when we were using an unfilled resin. This finding was similar to the respondents in our survey. Many practitioners share our frustration with caries diagnosis and low sealant success rate when using unfilled resins without surface preparation. We find it interesting that clinicians who have a relatively stable patient population and who have had several years of practice experience have evolved to surface preparation and filled resins in an attempt to assure that caries is not present and to increase the long term success rate.

After Cleaning out the Grooves



After Sealant



Failed Sealant



Public Perception

Parents can have a false sense of security regarding sealants. We have included the handout that we give parents. We want them to understand that sealants are not permanent nor are they foolproof. This disclosure helps prevent misunderstanding when restorations or resealing is required.

Discoloration Indicates a cavity



Another challenge is the child or teen with a high acid diet. Colas, fruit juice, sports drinks and carbohydrates are the nouveau diet for many of today's youth. Decalcification followed by composite deterioration is commonly seen in patients who have these adverse eating habits. We will choose an amalgam restoration in this high-risk population.

We realize that this is a controversial subject. We wanted to present our procedure and experience. You may have a completely different philosophy. This is a technique in transition, evident in the wide variations reported in the survey. No wonder the public is confused.

The Future

We are awaiting a Difoti to assist in caries diagnosis. Currently we use the Diagnodent . Radiographic surveys are difficult especially in detecting occlusal caries.

Some research is being conducted on laser sealants. This procedure would "melt" the superficial enamel into a smooth surface, eradicating the grooves. It is unclear what this would do to existing caries. This holds promise because it would not require a resin restoration.

In the final analysis, if soft drinks and carbohydrates continue to be consumed at an increasing rate, sealants will be a treatment of the past. We are spending a lot of time counseling parents about the consequences of a high acid diet. Caries is on the rise again and we are finding the sealant success that we have enjoyed is being replaced by disappointment when caries is found on proximal surfaces.

In the meantime, we will continue to advocate prevention including sealants. They still have a place in our armamentarium and it is a source of deep satisfaction when a patient returns for a preventive visit with glassy smooth occlusal surface instead of a cavity.

Photographs were taken by Dr. John Langren.

Bibliography:

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