

J TIM RAINEY, D.D.S., M.A.G.D.

P.O. Box 1044

606 Osage

Refugio, Texas 78377

(361) 526-4695 Fax (361) 526-4697

E-mail jtimrainey@tiads.com

jadaletters@ada.org

211 E. Chicago Ave.

Chicago, Ill

60611-2678

312 440-3538

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This is in regards to the JADA cover story on sealants, (J Am Dent Assoc, Vol 140, No 11, 1356-1365. Preventing dental caries through school based sealant programs. Updated recommendations and reviews of evidence). After more than 40 years into this disastrous sealant odyssey, we have yet another article representing uncounted millions of dollars of tax payer's monies and thousands of man hours of valuable time spent by our educators to tell us the same thing: "Sealants fail at an approximate 30% failure rate." How many articles proving that "Sealants have an approximate 30% failure rate" does the public need to support before the public forces organized dentistry to give up and endorse a technology that will work in preventing occlusal caries, the most common, destructive, and expensive of all caries?

In developing a model for success in any endeavor, the accepted technique for success in most scientific endeavors is to ask: "What are we trying to achieve?" After identifying the end point, work back to the present technology then map out the necessary steps to get to the goal. The stated goal of "Sealants" is to prevent caries. However, regardless of the tweaking and recommendations over the last couple of decades by the Universities and sealant companies, the success of sealants in practice has been hung up on a 30% failure rate, give or take a few insignificant percentage points, as supported by this article. Meanwhile, I successfully pursued the above scientific model in my approach to eliminating occlusal caries and 25 years ago introduced a technology that, upon refinement, would virtually eliminate the possibility of decay on the posterior teeth.

The ADA's historical track record of attempting to block new technology is now linked to the stellar record of a quarter century of ignoring reliable technology in favor of the sealant technology that has a predictable failure rate of approximately 30%. Coupled with the educational leg of the professions' absolute refusal to leave the anatomical drawings of the 17th century behind and correctly teach realistic and accurate tooth anatomy, there is no wonder that this article represents the low point in professional cooperation between the ADA, the dental universities, and the sealant companies.

As I began my decades of research and dental practice, sealants were first brashly, and authoratively promoted as a one-time-procedure that fixes all. It soon became clear that sealants couldn't live up to the promise of eliminating caries as a one-time procedure. As the members of the Texas Institute started questioning the long term effectiveness of

sealants more than two decades ago, the dental insurance companies, public health services, manufacturers, and the dental universities began to recommend the “maintenance of sealants”, with no clear cut guidelines. Finally, there was a recommendation made to “reseal every five years.” After another few years of questioning the wisdom of placing sealants, there is now seems a consensus of opinion from these same entities that sealants must be “replenished every three years”. One of the accepted definitions of insanity is to keep trying the same thing and expecting different results.

This overwhelming evidence of failure in the ADA article also raises several issues that can be boiled down to one question: “Why not do it right the first time?” In short, as the ADA article pointed out, sealants will work if the field is meticulously cleaned and dried, something that is obviously very difficult to achieve, demonstrated by the 30% failure rate in the routine practice of dentistry. How do you keep a partially erupted first molar in a six year old dry enough to accept a resin based sealant?

Fast forward to today, in a nutshell, my opinion is that traditional sealants are now obsolete, with mounting scientific evidence that unless sealants are meticulously maintained, eventual failure is the norm.^{i, ii} If sealants must be meticulously maintained to assure even marginal rates of success, the financial savings rapidly evaporate and then escalate over a lifetime considering that somebody must pay to replenish the sealants and then pay to repair the damage when sealants fail compared to “doing it right the first time.” Having repeatedly asked this question over the last quarter of a century, why did this obviously biased ADA article ignore the benefits of doing it right the first time?

The diagnostic technology of the past two Centuries relied on the familiar dental pick, the dentist’s visual skills, and “feeling” for early decay, very difficult and unreliable technology that is once again being endorsed by the ADA in this biased article on sealants. This technology has been proven time and time again woefully inaccurate in the routine general practice of dentistry for diagnosing the early presence of decay, yet here we are again revisiting a failed technique. This technique cannot possibly differentiate between sterile and harmless cavitations and active lesions. Meanwhile, failure to diagnose decay and then placing a sealant can result in serious decay. In practice, using this old technology to detect decay is less accurate than flipping a coin.

It is now possible to very accurately diagnose the presence of decay in the Virgin tooth structure on which many practices are currently placing sealants. There are a number of reliable technologies in decay detection, including greater than 90% accuracyⁱⁱⁱ by using Laser Caries Detection, yet a tremendous amount of public assets have been expended trying to debunk this technology because of the possibility of “false positives”, with the conclusion that dentistry needs to trash this technology that delivers greater than 90% accuracy. Even the current December, 2009 JADA reports a “significant improvement” in a headline article that only delivers 75% accuracy. Any technology is only part of a combination of assets used to arrive at a diagnosis, a point that is unnecessary to belabor.

Recently we accepted into our practice a family that claimed to be previously treated in the pediatric department of a major dental university represented in the JADA article that is the basis of this editorial. We found significant decay under most of the “sealants”, a reflection of the primitive state of diagnosis and treatment of that university, in my opinion, technology and technique that was strongly endorsed by this JADA article. The parent also had no memory of any use of magnification or instructions on the importance of “replenishing” the sealants every three years. As is often the case, we were able to detect decay under the “sealants” and were able to easily lift the mostly unbonded sealant off of this tooth to reveal massive decay.



The white material on surface of the far left six year molar tooth is the “sealant”, the popular resin based sealant materials used by most universities and endorsed by the ADA.

There are materials formulated to protect erupting teeth that will work in a poorly controlled, wet environment. These are the Glass Ionomer Cements that are conveniently ignored by the proponents of resin based sealants in the JADA article. The dentist first cleans the surface of teeth to be sealed with air abrasion, and then looks for undiagnosed decay. If there is previously undiagnosed decay in the fissure that can now be visualized, the decay can be properly addressed. The dentist then puts the GIC on the cleaned tooth surface, then protects the material with a gloved finger over the surface for five minutes. Using this method, the tooth will very seldom decay. If we do it in our office and it has to be redone, there is no charge. For my professional lifetime. This technology has been available to the academic population for 25 years and the public is still being bombarded with the inferior technology of “Sealants.”

Conversely, for or a traditional “Bonding” to work with resin based material, it will require a perfect peripheral seal on a perfectly cleaned and perfectly dry surface, particularly if the dentist chooses to leave decay (80% of molars erupt with some measurable decay).



We were able to lift the back side of the sealant off of the tooth where it was unbonded. The sealant stuck to the dry front side of the tooth and it broke. Look closely, you can see the line of the break. The surface of the tooth was soft and mushy, with deep decay. Take note that this was done under supervised conditions at a major dental university. This is the technology that dental universities teach in the United States today and is endorsed by the ADA.

Teeth also go through a period of “Maturation of Enamel” after they erupt. This is a biological fact that is either unknown to the proponents of sealants or just conveniently ignored. Teeth become harder and more resistant to decay with time. The entire maturing process of enamel is interrupted when a resin based “Sealant” is placed on the tooth. Using a Glass Ionomer Cement formulated for early erupting teeth allows the tooth to proceed through the maturation process while protecting the tooth from decay. Removing the geneses of the decay, hypocalcific enamel, may by itself eliminate future decay.



This is the underside of the sealant we lifted off of the tooth, and may be one of the first published at this magnification. This is what a groove system looks like in the surface of a tooth. This is magnified hundreds of times. Note that the resin based sealant did penetrate deep into the grooves. Also note that there is debris on this surface that probably was there when the sealant was placed.

It is interesting to note that one of the “accepted” methods of cleaning a tooth surface before placing a “Sealant” in the “recommendations” box on p. 1362 of the article in question is to use a tooth brush prophylaxis. How is a brush going to deeply penetrate these grooves? The brush leaves about as much trash in the groove as it cleans out. Also, there were absolutely no references, justification, or credit given to the author whatsoever in the article box in support of the recommendation not to use “additional surface preparations methods such as air abrasion..” I will note that air abrasion is the only method that will reliably, selectively, predictably, and effectively clean out a fissure. In keeping with the bias of the article, air abrasion is inexcusably summarily dismissed in the ADA article.

Placing sealants on undebrided fissures makes just as much sense as placing a bandage on a dirty, contaminated wound. Teeth are capable of healing the effects of decayed (cariou) lesions, and indeed have the ability to form a “scab” just like other tissue wounds in the body, as evidenced by reparative dentin. Only in dentistry is it OK to place a bandage (Sealant) over a contaminated wound in the body (decay in teeth). We solved

all of the problems associated with reliably sealing teeth 25 years ago and the dental industry and the universities are still trying to get around the truth by misleading the public with the help of the ADA.

Considering the current state of Dental Science, I believe it is time for the profession to move on to more definitive preventive measures based on science rather than technique. I do realize that many dental practices consider the dental hygiene department's daily charges or "Production of Sealants" an essential part of the daily practice income, but there is now indisputable scientific evidence that new methods are better than the stop-gap procedure of painting sealants on teeth and waiting to see what happens. This sealant "shotgun" approach to prevention in any other health care field is simply unacceptable.

This editorial is obviously a challenge to the current mindset of the organized dentistry and the almost universal willingness of the dental universities to deny the public access to reliable techniques that will prevent future decay, substituting a willingness to continue to promise a 30% failure rate. In my opinion, I believe it is time to move on to modern, scientifically based technology, leaving the technique of sealants in the last Century where it belongs. If conservation of tooth structure and reduction of future dental procedures is important for the members of this profession and their patients, families, children, grandchildren, or friends, the technology already exists and is proven to work.

Dr. Rainey can be reached @ jtimrainey@tiads.com or 361 526 4695

For more information visit www.jtimrainey.com

Dr. Rainey maintains a private practice in Refugio, Texas @ 606 Osage

ⁱ Clinical Research Associates Newsletter (CRA 23(12)1999

CRA Air Abrasion Treatment of Stained Pits & Fissures in Teenagers & Young Adults Under Age 30 Showed:

1. Cariious defects were almost always present under stained pits & fissures of non-smokers.
2. If sealants were placed years earlier, & not maintained, teeth were always decayed.
3. Practice of sealing stained pits & fissures need reconsideration.
4. Patients want to be made aware of their oral condition & help make treatment decisions. Most preferred to explore & excise rather than watch or seal, even though their insurance might not pay for treatment.

ⁱⁱ Feigal RJ: Sealants and preventive restorations: Review of effectiveness and clinical changes for improvement. *Pediatr Dent* 20:85-92, 1998.

Expected rate of sealant loss in permanent molars is 5% to 10% a year. Sealant success rates in studies involving regular upkeep of sealants are much higher; one

study involving annual recall and repair kept 85% of sealed teeth caries-free after 8-10 years. About 5% of sealed surfaces may require maintenance or restoration each year.

ⁱⁱⁱ Ross, Gerry Caries Diagnosis with the DIAGNOdent Laser: a user's product evaluation. Ontario Dentist March 1999 21-24