The primary objective of conservative periodontal therapy which is aimed at disease control and minimizing the periodontal disease progression by removing of calculus and plaque is root planing. Manual, sonic or ultrasonic scaling instruments are employed (Drisko 1998, Sattarzadeh et al. 2009). Current trends in tooth surface decontamination include the use of mechanized scalers and ultrasonic instrumentation. Since 1970 when the first ultrasonic scaler was introduced, ultrasonic scaling systems have become established among many dentists. The use of ultrasonic scalers allows cleaning of the root surfaces easier, causing less trauma to delicate mucosal tissue.

The powder's rounded microstructure reduces fatigue and being more efficient for debridement of the root surfaces. The particle size of the sodium bicarbonate powder could be varied by the number of strokes, size and pressure used as the abrasive. This resulted in a more aggressive effect. The consistency of the air stream was also varied for the patients. The patients should have had at least 11 teeth with interproximal spaces.

When the investigations were completed, the air polishing systems and ultrasonically-assisted scaling systems have become established as part of cutting-edge conservative periodontitis therapy. Air polishing methods use air pressures of 0.45 to 0.55 bar, and air velocities of 10 to 12 meters per second. The air-powder mixture is delivered to the tooth surface in the form of a jet or stream. The powder is delivered as a fine spray and finds its way into the periodontal spaces. The adjacent anatomical structures are not eroded and thorough removal of the subgingival biofilm on the root surface reduces marginal inflammation. The results for the four periodontal pathogens were compared using a Wilcoxon signed-rank test. The Wilcoxon signed-rank test was used to compare the microbiological results for the entire observation period and three months post-operatively. The microbiological results are summarized in Table 4. An increase in the number of BOP-positive teeth after air polishing reflects an improved inflammatory situation of the test sites which was improved after the AIR-N-GO PERIO® therapy. Microbiological results: The results for the four periodontal marker bacteria A. actinomycetemcomitans (Aa), T. forsythensis (Tf), P. gingivalis (Pg), T. denticola (Td) and, in addition, the total number of marker bacteria (TB) were recorded. The results in each case are given in the form of percentage of the total Bacillus count.

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Current Research on Improving Sealants

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By Katerina Kevavdia DDS, MS, PhD, Associate Professor and Director of Pediatric Dentistry Postgraduate Education in European University College Dubai - UAE

**D**ental sealants have been recognized as an effective means of preventing pit and fissure caries in primary and permanent molars. Hence, children are placed to prevent caries initiation and to arrest caries progression by providing a physical barrier that inhibits microorganisms and food particles from collecting in pits and fissures. It is generally accepted that the effectiveness of sealants for dental prevention depends on their long-term retention. What are the factors influencing the survival of fissure sealants prior to application, concerning better to the sealant retention?

It has been long known that remova- l of the superficial plaque from the fissures is essential prior to etching in order to allow bonding of the sealant. The classic technique for removing of the debris prior to sealing is prophylaxis with a non-fluoridated toothpaste, new techniques however have emerged, as such air-purging, abrasive techniques. Air-purging technique with sodium bicarbonate is a non-invasive removal of organic and other elements from pit and fissures. In the attempt to cover the depth of the sealant resin penetration and when combined with acid etching produce better mean bond strength. Although it is recommen- ded, never became the standard for sealant application procedure due to equipment cost and complexity of the procedure. Air abrasion with aluminum oxide particles is another alternative for cleaning of the fissures, and also produces roughening of the enamel surface. However, it is not a substitute to acid etching and appears to be inferior to the acid-etch tech- nique in order to achieve high sealant retention.

When both techniques of air abrasi- on and polishing are used, sim- ilar bond strengths have been found greater than when enamel is only air-abraded and then acid-etched. Enameloplasty or reshaping of enamel, is indicated in deep fissures and narrow fissures to improve, of which increase the fissure width and surface area available for etching and to enhance the accuracy of visual ex- amination. Studies have shown that air abrasion is effective in removing debris and gaps being evident and less microleakage, however its disadvantages are higher polymerization shrinkage and a necessary removal of intact enamel layers.

**Does the use of a bonding agent prior to sealant application influence its retention?**

Results from an in vitro study, in exten- sive use, demonstrated that a bonding agent after etching, and pri- or to sealant application since loss mi- croleakage was found even in the presence of contaminated with saliva enamel. However results from in vivo stu- dies, found no statisticall significant difference in sealant retention for up to two years of follow up. Of the use of a bonding agent because sealant application is suggested by the American Academy of Pediatric Dentistry. The practice is especially in deep and early carious lesions, since data from in vitro stu- dies support that there is deeper penetration especially in deep fissures with composite resin after acid etching as its use. What type of sealant material has the highest retention rate?

Two types of sealant materials are: the most commonly used, the resin based and the glass ionomer sealants. Resin- based sealants exhibit the highest re- tention rates and have better stability under occlusal forces due to their main component, Bis-Cem. However, teeth sealed with glass ionomer dentin caries less frequently than those sealed with resin and this has been attributed to the fluoride release from the glass ionomer cement. Even more, if the glass ionomer sealant is lost, some of the material remains in the depth of the fissures providing ex- tra preventive effect.

How successful are sealants over the years? What problems do you expect to occur?

Data on 200 patients after 15 years with autopolymerized sealants on permanent first molars, showed an 80% sealant retention at the time as this was analyzed during di- rection measurement immediately after intervention. Only A. acrylmetha- mylcarboxylate at three months after total elimination when examined at the six week point, with an increase to 0.13 ± 106. Porphyrornonas gingivalis reduced to 0.28 at three months which signifies a mean diminution of 84% compared to the original find- ings. The bacterium F. oxysphaerica exhibited a reduction to 0.26 which corresponds to a mean diminution of 93% based on the baseline find- ings.

**Microbiological profiles**

Microbiological analysis of the pooled samples, based on data not detected or lost, when initially examined, that 37% of the samples presented with As, 83% Pg, 51% Pe, 91% Th and 95% Tj. The proportion of contaminated po- cks increased immediately after treatment and increased again after six weeks, and in the third month, but without returning to the original values. Pg exhibited the greatest pre- vidence of all the species of bacteria at each point; the bacterium had been detected in 40% of pockets prior to treat- ment and in 20% of pockets immediately after therapeutically intervention, in 33.3% after six weeks and in 66.6% in the third month after the AIE-N-GO PROEI treatment.

If occurred in 60% of all the pockets at the initial examination. Post- operatively, the species was only found in 30% (immediately after intervention), 60% (in the sixth week) and 66.7% of pockets after three months.

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