Current Concepts On Improving Sealants Retention

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Dental sealants have been recognized in an effective and necessary tool for preventing pit and fissure caries in primary and permanent teeth in children. They 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 caries prevention depends on their long term retention. What is the importance of retaining the fissures prior to sealant application, constitutes better to the sealant retention?

It has been long known that remul- cation of the sealants during the first year is essential prior to etching in order to allow good bonding of the sealant. The classic technique for removing of the debris prior to sealing is prophylaxis with a non-fluoridated toothpaste, techniques however have emerged, such as air abrasion, air polishing techniques. Air polishing technique with sodium bicarbonate is a non-invasive removal of organic and other elements from pit and fissures. The depth of the sealant resin penetration and retention when combined with acid etching produce higher 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 for use in public health settings. When both techniques of air abrasion on acid etching are used, some- time bond strength have been found greater than when enamel is only air-abraded and then acid-etched. Enamoloympolishing or reshaping of enam- el, is indicated in deep fissures and narrow fissures to improve, of preventing pit and fissure caries, to increase the fissure width and surface area available for etching and to enhance the accuracy of visual ex- amination. Studies have shown with this technique that enamel and gaps being evident and less microleakage, however it’s disadvantages are higher polymerization shrinkage and a necessity of removal of intact enamel. The proportion of contaminated pits decreased 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 preva- lence of all the species of bacteria at each point; the bacterium was detect- ed in 40% of pits prior to treat- ment and in 20% of pits immediately af- ter therapeutic intervention, in 33.3% after six weeks and in 66.6% in the third month after the AIR-N-GO PROINO treatment. Td occurred in 60% of all patients at the initial examination. Post-opera- tively, the species was only found in 30% (immediately after intervention), 60% (in the sixth week), and 67% of pits after three months. Fig. 1b: Partially retained repaired, suggesting that the resin sealants pre- vent some antibacterial action even when completely or partially lost. Retention rates for the second molars were comparable to the first ones11. Sealants can be repaired Fig. 1b, by removing the superficial layer contaminated layer, acid etching, re- placing the sealant material and light curing.

Fig. 4: Partially retained repaired, by removing the superficial plaque contaminated layer, acid etching, replacing the sealant material and light curing.

Placement of pit and fissure sealants significantly reduces the percentage of non caries-affected lesions that progress in children, adolescents, young adults for as long as five years after sealant placement, compared with unsealed teeth9. Results of a sys- tematic review on the effect of sealants on bacteria in caries lesions, found that sealants reduce the caries lesion burden9, in some studies, low levels of bacteria were detected when using air abrasion over de- caries lesions. The presence of bacteria on surfaces with early caries may change in structure and content (Ca, P and mineral) due to organic residues remnants of cycles of re and demineralization that may inhibit the penetration of the sealant material at the deeper surfaces. In enamel results on extracted 3d molars showed that in decayed surfaces the sealant penet- ration was statistically significant less than in sound enamel. Further- more microleakage was found to be higher in teeth with initial caries, all suggesting that the retention rates may be negatively influenced. Is there any risk of toxicity using pit and fissure sealant materials?

There has been a growing concern recently regarding the BPA - Bisphenol A, used in the synthesis of matrix resins. It is a complex" (Pg, Tf, Td) were detected 3d molars, suggest the use of a proto- nol A. used in the synthesis of matrix resins at an even lower level than 0.03 x 106. Porphyromonas gingivalis and Treponema denticola were at an even lower level than 0.03 x 106. Porphyromonas gingivalis had reduced to 0.28 at three months which signifies a mean elimination of 84% compared to the original find- ings. The bacterium Td. Forsteri exhibited a reduction to 0.26 which corresponds to a mean elimination of 93% based on the baseline find- ings. Microbiological profiles Microbiological analysis of the pooled samples, based on data not depicted here, when initially examined, that 37% of the samples presented with As, 83% Pg, 51% Pi, 91% Td and 89% Tf. The proportion of contaminated pits decreased 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 preva- lence of all the species of bacteria at each point; the bacterium was detect- ed in 40% of pits prior to treat- ment and in 20% of pits immediately af- ter therapeutic intervention, in 33.3% after six weeks and in 66.6% in the third month after the AIR-N-GO PROINO treatment. Td occurred in 60% of all patients at the initial examination. Post-opera- tively, the species was only found in 30% (immediately after intervention), 60% (in the sixth week), and 67% of pits after three months. The bacteria P . gingivalis and T. forsy- thiana were at an even lower level than 0.03 x 106. Porphyromonas gingivalis had reduced to 0.28 at three months which signifies a mean elimination of 84% compared to the original find- ings. The bacterium Td. Forsteri exhibited a reduction to 0.26 which corresponds to a mean elimination of 93% based on the baseline find- ings. Microbiological profiles Microbiological analysis of the pooled samples, based on data not depicted here, when initially examined, that 37% of the samples presented with As, 83% Pg, 51% Pi, 91% Td and 89% Tf. The proportion of contaminated pits decreased 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 preva- lence of all the species of bacteria at each point; the bacterium was detect- ed in 40% of pits prior to treat- ment and in 20% of pits immediately af- ter therapeutic intervention, in 33.3% after six weeks and in 66.6% in the third month after the AIR-N-GO PROINO treatment. Td occurred in 60% of all patients at the initial examination. Post-opera- tively, the species was only found in 30% (immediately after intervention), 60% (in the sixth week), and 67% of pits after three months. Fig. 1b: Partially retained repaired, suggesting that the resin sealants pre- vent some antibacterial action even when completely or partially lost. Retention rates for the second molars were comparable to the first ones11. Sealants can be repaired Fig. 1b, by removing the superficial layer contaminated layer, acid etching, re- placing the sealant material and light curing.

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