

On Approximal Caries Prevention using Fluoridated Toothpicks, Dental Floss and Interdental Brushes

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av

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- I. Särner B, Lingström P, Birkhed D. **Fluoride release from NaF- and AmF-impregnated toothpicks and dental flosses in vitro and in vivo.**
Acta Odontol Scand 2003;61:289-296.
- II. Särner B, Birkhed D, Lingström P. **Approximal fluoride concentration using different fluoridated products alone or in combination.**
Caries Res 2008;42:73-78.
- III. Särner B, Birkhed D, Huysmans MCDNJM, Ruben JL, Fidler V, Lingström P. **Effect of fluoridated toothpicks and dental flosses on enamel and dentine and on plaque composition in situ.**
Caries Res 2005;39:52-59.
- IV. Särner B, Birkhed D, Andersson P, Lingström P. **Recommendations by dental staff and use of toothpicks, dental floss and interdental brushes for approximal cleaning in an adult Swedish population.**
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Abstract

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Although dental health has improved during the last 40-50 years, approximal caries still constitutes a problem in many age groups. It is important that fluoride (F) toothpaste is used when brushing the teeth. In some subjects, there may be a need for supplementary F products, especially in the caries-prone approximal area. **Aim:** The aims of this thesis were: i) to study the F release of F-containing approximal oral hygiene aids both *in vitro* and *in vivo*, ii) to evaluate different methods for the administration of F *in vivo*, iii) to study the effect of the frequent use of F-containing toothpicks and floss on demineralised enamel and dentine *in situ* and iv) to evaluate recommendations and the use of oral hygiene products for approximal cleaning in a Swedish adult population. **Material and methods and Results:** The F release of 26 brands of toothpicks and floss was followed for 24 hrs *in vitro*. A large variation in the release between these products was found; in general, toothpicks resulted in larger amounts of F compared with floss. The release *in vivo* was studied using single and multiple fluoridated toothpicks and dental floss, as well as in combination with toothbrushing or a mouthrinse with 0.2% NaF. Moreover, the administration of F by an interdental brush dipped in 0.2% NaF gel (here called the "Inter Dental Brush Gel Method") was evaluated. Approximal saliva was collected, using paper points, before and up to 60 min after treatment. Both toothpicks and floss resulted in enhanced F concentrations *in vivo*. An interdental brush dipped in 0.2% NaF gel and a mouthrinse with 0.2% NaF resulted in the same F concentration as after using multiple toothpicks. All combinations of toothpicks and dental floss with F rinsing resulted in higher concentrations than after only toothbrushing or in combination with brushing. The most optimal order was to use toothpicks and dental floss after toothbrushing and before rinsing. Fifteen adults with full dentures, in which demineralised enamel and dentine specimens had been mounted, were included in an *in situ* experimental caries model. Toothpicks or floss, impregnated with NaF and amine fluoride (AmF), were used regularly for four weeks. All the products inhibited continuous demineralisation - dental floss somewhat more than toothpicks. A reduction in plaque micro-organisms was also found. Recommendations made by dental staff in relation to approximal cleaning aids were evaluated by a questionnaire sent to 500 dentists, 500 dental hygienists and 1000 patients in Sweden. The ability to remove approximal plaque was also evaluated in 60 regular users of approximal aids. Recommendations by dental staff are mostly given to children and adolescents in order to prevent dental caries and to older individuals to prevent gingivitis and periodontal disease. Approximal plaque appears to be more easily removed by regular users of interdental brushes compared with the use of toothpicks and dental floss. **Conclusions:** The use of fluoridated interdental aids appears to be important in order to reduce approximal caries. An interdental brush dipped in a NaF gel is an interesting method for increasing approximal F concentration.

Key words: Approximal caries • Dental flosses • De- and re-mineralization • Fluoride • Interproximal aids • Interproximal area • Oral hygiene • Questionnaire • Toothpicks

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