PEDIATRIC DENTISTRY/Copyright © 1987 by
The American Academy of Pediatric Dentistry
Volume 9 Number 2

# The combined use of pit and fissure sealants and fluoride mouthrinsing in second and third grade children: final clinical results after two years

Louis W. Ripa, DDS, MS Gary S. Leske, DDS, MS, MPH
Francine Forte, RDH

**Abstract**

*The combined benefits of pit and fissure sealants and weekly mouthrinsing with a 0.2% neutral NaF solution were assessed in children who initially had no caries or restorations in their permanent teeth. Ninety-five children participating in a school-based weekly fluoride mouthrinsing program since kindergarten had sealants applied to their first permanent molars when they were in the second and third grades. Only 3 lesions were found in the 84 children who were available for examination after 2 years; 96.4% remained caries free. One hundred thirty-one children who participated in the fluoride mouthrinsing program but who did not have sealants applied served as the control group. A large percentage of these children were eliminated from the study because sealants were applied to their teeth by private dentists. In the 51 children who were available after 2 years, 24 surfaces had decayed or were restored, and 78.4% of the children were caries free. The combination of pit and fissure sealants and weekly fluoride mouthrinsing resulted in the nearly complete elimination of new carious lesions.*

Because fluoride mouthrinsing has its greatest relative caries protective benefit on smooth tooth surfaces and since sealants protect only pit and fissure surfaces, several investigators have used these methods in combination on the same subjects.[1] Ripa et al. (1986) have reported the first year's results of a pilot study in which sealants were applied to the first permanent molars of children who were already participating in a school-based fluoride mouthrinsing program. This report presents the final results of this study 2 years after sealant placement.

The purpose of the study was to compare the caries increments of the sealant/F-mouthrinse treated children to children who were only participating in the mouthrinse program. The status of the sealants also was assessed.

## Methods and Materials

Ninety-five second and third grade children (ages 7–8 years) had their 4 first permanent molars sealed with an autopolymerized sealant.[a] The sealant was applied to all 4 occlusal surfaces. In addition, the buccal pits of the mandibular molars and lingual grooves of the maxillary molars were treated—provided they were sufficiently erupted to maintain dryness. Based upon a visual-tactile examination using the criteria of Radike (1972), the children, who were in the mixed dentition, had no caries or fillings in their permanent teeth at the baseline examination. All of the children were enrolled in a school-based fluoride mouthrinsing program since kindergarten in which they rinsed once a week under supervision with a 0.2% neutral NaF solution (Ripa et al. 1983).

The control group of subjects initially consisted of 131 second and third graders who also participated in the fluoride mouthrinsing program since kindergarten but who did not receive sealants. All of their permanent teeth were caries free at the time of their entrance into this study.

The treated and control group of children were re-examined after 1 year at which time 87 and 81 children, respectively, were available. At this visit, missing sealant was replaced if the surface was caries free. A final visual-tactile caries examination was conducted after 2 years by the same examiner. A detailed description of the study methods is available in the article which presents the first year's results (Ripa et al. 1986).

[1] Bagramian et al. 1978; Bagramian 1982; Bell et al. 1984; Low 1982; Rantala 1979.

[a] Delton Tinted Sealant—Johnson & Johnson Dental Products Co; East Windsor, NJ.

TABLE 1. Two-Year Caries Increment of Initially Caries-Free Second and Third Grade Children

| Group | Number of Subjects | Number DFS Per Child | Total Number of DF Surfaces | DF Surface Distribution | | | |
|---|---|---|---|---|---|---|---|
| | | | | Occ | B | L | Prox |
| F-mouthrinse/sealant | 84 | 0.03 | 3 | 2 | 0 | 1 | 0 |
| F-mouthrinse | 51 | 0.47 | 24 | 15 | 7 | 2 | 0 |

## Results

After 2 years, 84 of the original sealant/F-mouthrinse treated children and 51 of the original F-mouthrinsing control group were available for examination. Many of the children were eliminated from the control group because they received sealants from their own dentist. Other children from both groups lost from the study either moved out of the school district where the study was conducted or were absent at the time of their examination.

Table 1 presents the 2-year DFS increments. There were no caries in permanent anterior teeth and the increment consists entirely of caries or restorations of the first permanent molars. All of the lesions or restorations involved the pits and fissures. Three surfaces were carious or filled in the sealant/F-mouthrinse group and 24 surfaces in the F-mouthrinse control group. The 3 lesions in the sealant/F-mouthrinse group were in 3 children. Thus, 81 or 96.4% remained caries free. The 24 lesions or restorations in the control group were in 11 children; thus, only 78.4% remained caries free.

The status of sealants on the occlusal surfaces is presented in Table 2. Buccal pits and lingual grooves are not included in the table since they were not sealed if they were morphologically absent or if complete isolation could not be maintained at the time of the initial treatment. Ninety-six per cent of the teeth were completely covered after 2 years, although 8 occlusal surfaces had been retreated at the 1-year recall visit.

## Discussion

The results indicate that the combination of fluoride mouthrinsing and sealants applied to first permanent molars can dramatically reduce the incidence of caries of the permanent teeth of children in the transitional dentition stage. Because the number of subjects in this study was small, the actual number of surfaces saved from the use of sealants was also small. Nevertheless, by adjusting the number of subjects in the F-mouthrinsing group to match that of the other group, 39.5 surfaces would have decayed in the F-mouthrinsing group, compared to 3 surfaces in the sealant/F-mouthrinsing group. Thus, the caries rate of the children who were not protected by sealants was 13 times that of the group that was. This is a substantial difference with profound clinical implications when applied to a larger population.

Of equal importance concerning the dental health of school age children is the finding that the addition of sealants to a school-based fluoride mouthrinsing preventive program increased the percentage of caries free children from 78 to 96%. Certainly, the combined use of fluoride mouthrinsing and sealants should be encouraged for individual patients in office programs and for community preventive programs which are conducted in our children's schools.

Supported in part by Biomedical Research Support Grant #SO7-RRO5778-10 and a grant from the Johnson & Johnson Dental Products Company.

Dr. Ripa is a professor and chairman, Dr. Leske is a professor, and Ms. Forte is a research field coordinator, children's dentistry, the State University of New York at Stony Brook. Reprint requests should be sent to: Dr. Louis W. Ripa, Department of Children's Dentistry, School of Dental Medicine, State University of New York at Stony Brook, Stony Brook, NY 11794-8701.

Bagramian RA, Graves RC, Srivastava S: A combined approach to preventing dental caries in school children: caries reductions after 3 years. Community Dent Oral Epidemiol 6:166-71, 1978.

Bagramian RA: A 5-year school-based comprehensive program in Michigan, U.S.A. Community Dent Oral Epidemiol 10:234-37, 1982.

Bell RM, Klein SP, Bohannan HM, Disney JA, Graves RC, Madison R: Treatment Effects in the National Preventive Dentistry Demonstration Program. Santa Monica, CA; Rand Corporation, 1984 p 82.

Low T: The combined application of topical fluoride and fissure sealant—results after 2 years. J Oral Rehabil 9:1-5, 1982.

TABLE 2. Occlusal Sealant Status of First Permanent Molars at 2-Year Examinations

| Number of Treated First Molars | Completely Covered | | Partially Covered | | Uncovered | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| 336 | 324 | 96.4 | 11 | 3.3 | 1 | 0.3 |

Radike AW: Criteria for diagnosis of dental caries, in Proceedings of the Conference on the Clinical Testing of Cariostatic Agents. Chicago; American Dental Association, 1972 pp 87–88.

Rantala EV: Caries incidence in 7- to 9-year-old children after fissure sealing and topical fluoride therapy in Finland. Community Dent Oral Epidemiol 7:213–17, 1979.

Ripa SW, Leske GS, Sposato A, Rebich T: Supervised weekly rinsing with a 0.2 percent neutral NaF solution: final results of a demonstration program after six school years. J Pub Health Dent 43:53–62, 1983.

Ripa LW, Leske GS, Forte F: The combined use of pit and fissure sealants and fluoride mouthrinsing in second and third grade children: one-year clinical results. Pediatr Dent 8:158–62, 1986.

## Correction

Due to an author's oversight, there was an error in the December issue of Pediatric Dentistry. Figure 5 is incorrect in the article *Gemination of a maxillary permanent central incisor treated by autogenous transplantation of a supernumerary incisor: case report* (Pediatr Dent 8:299–302). The preoperative radiograph was substituted as the 2-year postoperative radiograph. The correct Figure 5 appears below.