**Jawbreakers Have Erosive Potential**

Many factors influence dental erosion, including dietary acids found in carbonated beverages and acid candies. When sour candies are dissolved in water, the pH drops to between 2.3 and 3.1. Enamel dissolves at a pH of 5.5.

Using a questionnaire, researchers in The Netherlands asked 300 children between 10 and 12 years about jawbreaker consumption. Two-thirds of the children reported eating jawbreakers, with boys (73 percent) eating them more than girls (60 percent). Eighteen percent reported having eaten one or more in the past week. Most of the children reported holding the jawbreaker in their cheek and keeping it in their mouth more than 15 minutes. Some reported playing a game of who could hold it in their mouth the longest.

To test oral pH, dental students were recruited (as the Medical Ethics Committee prohibited children from participating). Dental students tested four jawbreakers from Zed Candy in Dublin, Ireland: strawberry, jumbo, fire and sour. The jumbo jawbreaker was 31mm in diameter and the others were 23-24mm in diameter. All contained citric acid. Salivary flow increased nine to 14 times baseline levels within the first minute of sucking the candy and remained high for the three minutes it was in the mouth, returning to baseline levels by six minutes. All but the fire jawbreaker lowered salivary pH well below 5. They returned to neutral pH by eight minutes.

Clinical Implications: Ask your child patients about their sour candy consumption, including how long they hold a jawbreaker in their mouth. The longer they have it in their mouth, the longer their teeth are exposed to dangerously low pH levels, despite increased salivary flow.


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**Tongue Cleaning Reduces Bad Breath**

Everyone has bad breath sometimes, and some people have chronic bad breath all the time, from 25 to 50 percent, depending on the population. Morning bad breath is due to overnight dryness when saliva flow is at its lowest, enhancing the growth of oral bacteria. Bacterial biofilm accumulates on and around the teeth, and also is part of tongue coating, especially on the dorsum of the tongue. Eating and drinking in the morning tends to eliminate overnight bad breath, but sometimes it is a chronic problem.

Ninety percent of bad breath can be attributed to oral causes including caries, periodontal disease, poor oral hygiene and tongue coating. The gold standard of measuring bad breath is organoleptic testing or smelling the person’s breath. It is also measured by the level of unpleasant smelling volatile sulfur compounds (VSC) in the mouth air.

Researchers at three universities in The Netherlands reviewed the research to determine if tongue cleaning with a scraper or toothbrush in addition to regular oral hygiene would reduce oral malodor. Of the 405 studies and abstracts their search produced, 22 full-text articles were read and 17 of these were excluded as they didn’t match the established criteria they were looking for in the studies. The five studies that did fit all criteria were evaluated and compared, showing that tongue scraping or brushing does reduce oral malodor. These studies did not evaluate chronic bad breath.

Clinical Implications: Results of this systematic review suggest that cleaning the dorsum of the tongue with a scraper or brush will reduce oral malodor.


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*continued on page 5*
**Statin Drugs Enhance Bone Formation**

Statin drugs are used to control blood cholesterol levels by reducing the liver's ability to produce cholesterol. This is done by blocking an important protein needed in this process, HMG CoA reductase. Other benefits have been reported from taking statin drugs that impact growth factors and proteins associated with bone regeneration. Animal studies show increased mandibular bone growth with protective effects on tooth attachment and alveolar bone. Topically applied statin drugs following tooth extraction in rats showed stimulated osteoblast formation compared to controls.

Retrospective studies of humans with periodontal disease who were taking statin drugs found shallower probing scores compared to similar controls not taking the drug.

Researchers at the University of Guanajuato in Leon, Mexico compared the effects of 20mg/day atorvastatin (ATV) and a vitamin placebo following SRP. Placebo pills contained vitamins B1, B6 and B12. Subjects were blinded to their assigned medication. SRP was done by quadrants with one visit per week.

There were 13 subjects in the SRP group and 15 patients in the SRP plus atorvastatin group. Probing depth reductions and clinical attachment level gains at six months were both 0.8mm in the test group and 0.3mm in the SRP only group. Both groups showed significant reductions in bleeding on probing after treatment. Microbiological testing revealed a significant reduction in the detection of *P. gingivalis* in the atorvastatin group compared to the SRP only group.

Clinical Implications: For patients who test positive for *P. gingivalis*, taking systemic azithromycin in conjunction with SRP might enhance reduction of bacterial counts.


**Azithromycin Enhances SRP Outcomes**

Periodontal disease is associated with a multi-species bacterial biofilm. These bacteria trigger an inflammatory response that ultimately causes destruction of connective tissue and bone. *P. gingivalis* is one of the subgingival bacterial species that is often found in chronic periodontitis cases.

Mechanical disruption of bacterial biofilm with scaling and root planing (SRP) is an effective way to eliminate periodontal pathogens, control tissue destruction and prevent further infection and inflammation. Several systemic antibiotics have been tested in conjunction with SRP to amplify eradication of specific pathogens.

Researchers at Complutense University in Madrid, Spain compared SRP alone and SRP plus three days of systemic azithromycin in patients with chronic periodontitis testing positive for subgingival *P. gingivalis*. SRP was provided under local anesthesia by perio graduate students using both power and hand instrumentation in two 90-minute visits within one week. Follow-up visits were scheduled at one, three and six months. Oral hygiene instructions were reviewed at each visit.

There were 13 subjects in the SRP group and 15 patients in the SRP plus azithromycin group. Probing depth reductions and clinical attachment level gains at six months were both 0.8mm in the test group and 0.3mm in the SRP only group. Both groups showed significant reductions in bleeding on probing after treatment. Microbiological testing revealed a significant reduction in the detection of *P. gingivalis* in the azithromycin group compared to the SRP only group.

Clinical Implications: For patients who test positive for *P. gingivalis*, taking systemic azithromycin in conjunction with SRP might enhance reduction of bacterial counts.

Sealants Versus Infiltrants

Despite a decline in caries in industrialized countries, caries on approximal surfaces remain a significant problem. Reports suggest rates as high as 81 percent of five years olds have non-cavitated approximal enamel lesions and 96 percent of adolescents have one or more past or active carious lesions. Adolescents at high risk for caries average four lesions. Surfaces of early, non-cavitated enamel lesions are 10 to 50 times more porous than intact enamel. Traditional preventive measures that promote remineralization include oral hygiene, fluoride and nutritional counseling, but many don’t comply. Sealants and infiltrants provide a means of stopping demineralization and in some cases, promoting remineralization. A sealant will cover over the non-cavitated lesion, providing a diffusion barrier. An infiltrant will penetrate into the lesion, replacing lost minerals with a light cured, low-viscosity resin. This provides mechanical support to fragile enamel while blocking caries progression.

Researchers at the University of Campinas in Sao Paulo, Brazil reviewed the literature comparing sealants and infiltrants for the treatment of non-cavitated, approximal lesions. It is difficult comparing lab and clinical studies as the lesions are not actually the same. Lab studies provide a starting point, but more clinical studies are needed comparing sealants and infiltrants on smooth surfaces. Findings suggest that fluoride should not be used prior to treatment, as fluoride hardens the surface of the enamel and does not penetrate to the depth of the non-cavitated lesion.

Clinical Implications: Sealants are best used in pits and fissures, while light-cured infiltrants provide deeper penetration in smooth surface, non-cavitated lesions without leaving a surface margin.


No Benefit from Higher Concentration Chlorhexidine

Chlorhexidine (CHX) has long been considered the gold standard in oral rinses for the control of bacterial plaque and inflammation. CHX was first used to control gingivitis and is also used now following SRP and periodontal surgery. It is also used effectively to control MRSA infections in critical care units and to control and prevent oral mucositis in bone marrow transplant patients.

A new formulation of CHX is now available over the counter in Switzerland. Parodentosan contains 0.05 percent CHX plus peppermint, tincture of Myrrh, sage oil, sodium fluoride, xylitol, water, glycerine and alcohol. Researchers at the University of Bern compared this new formulation to Plakout, the standard Swiss 0.1 percent CHX rinse. The comparison was made in a group of 45 subjects undergoing periodontal surgery. Test and control rinses were bottled identically and labeled simply “Test Solution B” or “Test Solution C.” Rinses were randomly assigned and all subjects were instructed to rinse twice daily for four weeks following surgery.

Clinical and microbial evaluations at four and 12 weeks showed no differences in probing depth changes or subgingival bacterial counts between the two groups. The only difference observed was for tooth staining. At 12 weeks, staining in the Parodentosan group showed an increase of seven percent, compared to an increase of 37 percent in the Plakout group. None of the study subjects complained of tooth staining during the study.

Clinical Implications: For Swiss clinicians, Parodentosan CHX rinse might be as effective as Plakout rinse, with less staining of tooth surfaces.

Duss, C., Lang, N., Cosyn, J., Person, R.: A Randomized, Controlled Clinical Trial on the Clinical, Microbiological, and Staining Effects of a Novel 0.05% Chlorhexidine/Herbal Extract and a 0.1% Chlorhexidine Mouthrinse Adjunct to Periodontal Surgery. J Clin Perio 37: 988-997, 2010.