

CLINICAL REPORTS

Dental Erosion and Aspirin Headache Powders: A Clinical Report

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The causes of tooth erosion are varied, but all are associated with a chemical attack on the teeth and resulting loss of tooth structure. Etiologic factors related to erosion cited in the literature include bulimia, eating acidic foods, soft drink consumption, acid reflux, and swimming, among others. This clinical report suggests that chronic use of headache powders can also be a factor leading to tooth erosion.

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DENTAL EROSION and its causes (which are as diverse as the patients themselves) continue to present challenges for the clinician. Erosion occurs when tooth structure is dissolved by chemical action not related to bacterial plaque. This differs from the process of attrition, which is a mechanical abrasion of the dentition (eg, bruxism). The patient described in this report demonstrated severe erosion of her mandibular teeth, the cause of which has not been commonly described in the literature. After careful consideration of all patient habits, oral practices, food consumption patterns, and the review of other potential causes for dental erosion, it was determined that the erosion resulted from chronic use of an aspirin headache powder. This over-the-counter product, composed of aspirin, acetaminophen, and caffeine, is commonly used by patients to treat headaches, and is designed to be dissolved in water before swallowing.

Initial Presentation and Diagnoses

A 38-year-old female patient presented at our clinic with a chief complaint of cold sensitivity in her mandibular teeth. The patient suffered from frequent headaches and had a 3-year history of head-

ache powder use. When questioned further about pain medications, the patient described herself as an "aspirin addict." The health history was otherwise noncontributory. The patient reported using as many as 6 doses per day of an over-the-counter headache powder to control her headaches. Each dose contained 520 mg aspirin, 260 mg acetaminophen, and 32.5 mg caffeine. The patient placed the undissolved headache powder sublingually to increase the rate of absorption, as a result bathing the mandibular teeth in an acidic solution of dissolving aspirin.

An oral examination revealed severe erosion on the occlusal surfaces of the mandibular molars and premolars and moderate erosion of the mandibular anterior teeth (Fig 1). Less erosion was evident on the maxillary teeth (Fig 2). Some mild ditching of the lingual margins of the maxillary veneers was noted. No caries was evident, and the periodontal condition of the dentition was excellent, with only localized areas of mild periodontitis and generalized mild marginal gingivitis.

Because of the rapid dissolution of tooth structure, restoration of occlusal vertical dimension was deemed necessary. The closest speaking space was evaluated phonetically and revealed that the patient could accommodate a moderate increase in vertical dimension of approximately 2 to 3 mm.

Clinical Treatment

Casts of the dentition and interocclusal records were made, and a diagnostic wax-up was fabricated at the increased vertical dimension of occlusion. The mandibular teeth were prepared for full coronal restorations, followed by placement of acrylic provisionals. The patient functioned for 4 weeks at the increased

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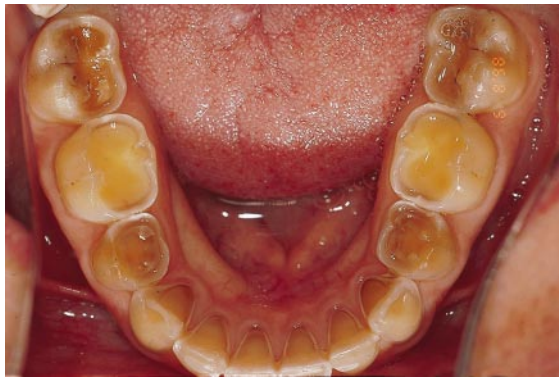


Figure 1. Mandibular teeth showing signs of significant erosion.

vertical dimension (1.5 mm) to verify comfort and occlusal harmony. Teeth 18 and 31 were restored with complete cast gold restorations, whereas the other posterior teeth were restored with metal ceramic restorations (Fig 3). The anterior mandibular teeth were restored with all-ceramic restorations (Empress; Ivoclar AG, Liechtenstein, Germany; Fig 4).

The maxillary arch was not restored, as the patient expressed financial concerns; the erosion present was considered minor; and the existing restorations were judged serviceable and maintainable.

The patient was referred to a physician for treatment of the rebound headaches, and the potential for tooth erosion caused by aspirin products was explained to the patient. The patient was pleased with the restorations and reported discontinuing use of the headache powders. She was provided with an



Figure 2. Erosion of maxillary teeth is evident, though not as dramatic as found on the mandibular teeth.



Figure 3. Restoration of mandibular teeth with metal, metal ceramic, and ceramic restorations. (Courtesy of Dr. S. Jean O'Neal.)

occlusal therapy device to be worn while sleeping to protect the occlusal surfaces of the restorations, and was placed on a 6-month recall.

Discussion

Most commonly, erosion is associated with eating disorders such as bulimia. Bulimia is characterized by regurgitation of gastric contents, which can have a severe effect on the dentition over a period of time.¹⁻³ The mean pH of the gastric contents measured in bulimics is 3.8, well below the demineralization point of enamel.⁴ Typically, the acid has a greater effect on the maxillary teeth than on the mandibular teeth, which are somewhat protected from exposure by the tongue.⁵ Other conditions that may be associated with acid reflux and tooth erosion include anorexia nervosa, gastric disturbances, endocrine disorders, and drug abuse.^{2,6,7}

A surprising array of other causative factors have been implicated in published studies and clinical reports. Many foods with a naturally low pH can



Figure 4. Completed restoration at restored occlusal vertical dimension. (Courtesy of Dr. S. Jean O'Neal.)

cause tooth erosion in unusual circumstances. Heavy soft drink consumption has been associated with tooth erosion and increased tooth sensitivity in some populations, as well as heavy consumption of acidic fruit juices, such as orange and grapefruit juice.⁸⁻¹¹ Alcoholism may be a cause of tooth erosion, both as a result of the associated gastric disturbances and the direct action of the alcoholic beverages.^{6,12,13} Interestingly, clinicians have published several reports describing erosion in professional wine tasters.¹⁴⁻¹⁷ Swimmers using chlorinated pools may present with tooth erosion, sometimes occurring in a unique erosion pattern in the mouth as a result of exposure of the facial surfaces of teeth on only one side when the swimmer takes a breath.^{18,19} Even normal breathing can become a cause of dental erosion, if acid fumes are present in the workplace, as may be seen in battery factories and industrial situations.¹⁹⁻²² This type of erosion may affect primarily the facial surface of the maxillary incisors, which are less protected from the acidic fumes in the air.²⁰ Finally, chewable tablets such as vitamin C or hydrochloric "health food" tablets may contribute to tooth erosion.^{23,24}

This clinical report adds to this list another possible cause of tooth erosion: chronic use of aspirin powders for treatment of headaches. Many of these headache powders (eg, Goody's Extra Strength Headache Powders; Goody's Pharmaceuticals, Memphis, TN; BC Powder; Block Drug Company, Inc, Memphis, TN) contain aspirin as well as large amounts of caffeine. Patients find relief from typical headaches using these over-the-counter medicines. However, chronic overuse of aspirin or aspirin and caffeine medications can lead to analgesic rebound headaches.²⁵⁻²⁷ Typically, a patient will use a nonsteroidal anti-inflammatory drug or a salicylate such as aspirin to treat a common headache. If the drug is overused, a type of dependence cycle occurs. When the drug is eliminated from the system, an analgesic rebound headache develops, and the patient takes more of the analgesic, continuing the cycle. At this point, even when medication is stopped, daily headaches can continue for as long as 6 months.²⁸ Analgesic rebound headaches are reported in up to 40% of physicians' practices,²⁹ and up to 73% of patients in headache clinics overuse analgesics and suffer from rebound headaches.^{25,27}

Summary

The patient described in this clinical report chronically used headache powders sublingually. This was

the most likely cause of the erosion noted on the mandibular teeth. This report suggests that frequent use of headache powders should be considered when searching for a possible cause of erosion.

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