

# UPDATE ON Patient Care

*Helping your patients maximize  
between-visit oral health.*

## Tooth Wear and Erosion

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*Although tooth wear* is not top-of-mind for most dental patients, many put themselves at risk for tooth wear on a daily basis. For instance, patients who start the morning off with seemingly harmless orange juice and a sugary donut have just begun a long cycle of acid erosion and tooth wear. Acid erosion, one of the major contributors to tooth wear, is a chemical process resulting from acids in foods and beverages. The American diet increasingly emphasizes acidic foods and beverages, and tooth wear caused by acid erosion has become an emerging problem. Additionally, increased life expectancy rates mean patients are now living longer and subsequently need longer-lasting teeth, making tooth wear an increasingly important issue. This article will attempt to provide a complete understanding of tooth wear and the growing issues of tooth wear and acid erosion in dentistry today.

### TOOTH WEAR IN DETAIL

It is estimated that on average, teeth wear at about 30  $\mu$  per year, or about 0.3 mm in 10 years.<sup>1</sup> However, when factors such as diet, oral hygiene and oral fixations, or other detrimental habits compound normal wear, tooth wear becomes far more advanced and affects the oral cavity to a greater extent. Problematic tooth wear is frequently attributed to erosion, abrasion, or attrition.

### Erosion

Erosion is explained as the loss of hard dental tissue related to chemical processes not involving bacteria. The main culprits of erosion—acidic foods and beverages—cause thinning of enamel, smooth surfaces, loss of surface characteristics, dentin exposure, and grooves.<sup>2</sup> Patients with lifestyle habits such as “swishing” or holding acidic drinks in the mouth accelerate the loss of hard tissue because of erosion.<sup>3</sup> In addition, medications that are acidic in nature, such as

vitamin C and aspirin, may cause dental erosion if chewed or held in the mouth before swallowing.<sup>4</sup> As such, patients with other health problems who experience pain or discomfort daily may be at an increased risk of tooth wear, as they may frequently chew or hold aspirin against their teeth.

### Abrasion

Sometimes tooth wear is a result of repeatedly misusing teeth. Abrasion refers to lost tooth structure from pressure caused by foreign objects, including biting into objects or aggressively brushing teeth. While tooth translucency and grooves can be symptomatic of erosion, wedge-shaped lesions on teeth are a frequently cited symptom of abrasion from toothbrushing. Even ordinary toothpaste can damage teeth when paired with aggressive brushing. In laboratory testing, toothbrush strokes showed no wear on surfaces when used with water, but exhibited wear when toothpaste was added.<sup>5</sup> Not only is keeping a toothbrush clean and in good condition an important characteristic of good oral health, but so is using the right toothpaste formulation to protect teeth.

In addition to aggressively brushing, most patients use hard filament toothbrushes known to increase patient susceptibility to tooth wear. In fact, a recent study found 75% of subjects studied reported a history of having used a firm or hard toothbrush.<sup>6</sup> The same study found that distribution of oral lesions was associated with a patient’s dominant hand, because 64% of wedge-shaped lesions on right-handed users were located on the left side of the mouth.<sup>6</sup> This indicates that patients may brush aggressively with their dominant hand, with most using the back-and-forth linear brushing technique commonly associated with abrasion. Practitioners should note patients’ brushing tendencies to monitor wear over time on the opposite side of the dominant hand.

### Attrition

Tooth wear is not always a result of an outside substance or object. The loss of hard tooth structure from a patient’s own tooth-to-tooth collision is defined as attrition. Patients with a history of jaw parafunction and bruxism may have an increased probability of attrition.<sup>4</sup> In addition to tooth wear, consequences of attrition include fractured teeth or dental work. To help determine if bruxism or attrition exist, ask whether the patient makes grinding noises during sleep and whether he or she experiences morning jaw muscle tenderness or fatigue.<sup>4</sup>

### Dietary Trends

Dental professionals are now seeing patients whose teeth are showing signs of increased tooth wear.<sup>7</sup> These trends indicate a need for dentists to thoroughly screen during dental examinations and give comprehensive dietary and lifestyle advice as a part of treatment. The increasing rate of tooth wear suggests that many patients are unaware and/or uneducated that they are putting their teeth at risk. For example, many patients do not know that sugar can be listed as high-fructose corn syrup, fructose, sucrose, glucose, or dextrose, and acid can be simply labeled “carbonated,” which really means carbonated acid. Therefore, education is a key component of the treatment process.

### EARLY IDENTIFICATION IS KEY

A typical patient with tooth wear may be unaware of the state of his or her teeth, but may experience painful sensitivity or tooth discoloration. To help manage these symptoms, dental professionals need to identify the problem in its early stages and institute a comprehensive approach to the management of tooth wear.

Additionally, patients with erosion or tooth wear may be hard to identify because of the typically slow progression of erosion and onset at a relatively young age. Dental professionals may need to question patients in detail about their dietary and other oral habits to diagnose a tooth-wear sufferer. Patients who are diagnosed with tooth wear may exhibit risk factors such as:<sup>4</sup>

- soft drinks consumed four or more times per week;
- vomiting weekly or more;
- excessive attrition;
- symptoms or history of gastroesophageal reflux disease;
- decreased salivary flow rate; and
- bruxism.

### PREVENTION AND TREATMENT

Because tooth wear cannot be reversed, early intervention is vital. To treat patients who demonstrate tooth wear, dentists can follow a comprehensive consultation agenda.<sup>8</sup> First—and most importantly—diagnose the type of the wear, whether acid erosion, bruxism, abrasion, or a combination of wear types. Once the type is determined, check the patient’s diet for frequency of acidic food and drink intake and presence of detrimental drinking or dietary habits. Ask about possible gastric causes such as reflux, frequent regurgitation, or eating disorders. It is best to classify the tooth wear by mild, moderate, or severe (remembering the impact of age) while determining the cause. When considering treatment, consult with the patient about his or her dietary choices. In addition, dental professionals can advise patients to follow a specific oral health regimen, including:

- brushing teeth in a gentle, circular manner. Avoid brushing teeth immediately after ingesting acidic foods or beverages, rinsing with water frequently;<sup>6</sup>
- disposing of toothbrushes with splayed toothbrush filaments. There has been less abrasion reported with a roll brush technique than linear, and less still with a rotary action toothbrush.<sup>9</sup> Advise patients to purchase a rotary action toothbrush and change the head frequently; and
- using remineralizing toothpastes with high fluoride availability.

The patient’s toothbrushing procedure can easily be evaluated and improved, along with his or her choice of dentifrice. To protect patients’ teeth from abrasive influences, dentists may recommend products designed to protect tooth enamel. Common suggestions for the prevention of tooth wear progression include using soft toothbrushes and non-abrasive dentifrices, such as Sensodyne® Pronamel™ (GlaxoSmithKline, Research Triangle Park,

- intake of citrus fruits more than twice daily;
- consumption of sports drinks weekly or more;



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NC) or Enamel Care® (Arm & Hammer, Princeton, NJ). The choice of toothbrush and toothpaste can be enormous factors in influencing a patient's oral health.<sup>10</sup> Choosing the right toothbrush and toothpaste can help halt tooth wear and symptoms for your patients, but only education and an understanding of the consequences of poor diet, poor oral hygiene, and detrimental habits can prevent patients from damaging teeth any further.

### TAKE ACTION NOW

Although tooth wear cannot be reversed, the painful symptoms of tooth wear may be treated. By changing diet, hygiene, or damaging habits, using fluoride rinses, gels, and varnishes as well as high-fluoride toothpastes and remineralizing toothpastes, tooth wear may be slowed or even halted.<sup>2</sup> Left alone or protected from physical insult, demineralized enamel appears to have the potential to reharder if contained in a suitable salivary or artificial salivary environment.<sup>11</sup>

Dental professionals can help their patients relieve pain and curb the preponderance of tooth wear and erosion by taking a proactive role in educating their patients about dietary and lifestyle choices and the corresponding effects on oral health. By having a meaningful discussion with each patient about lifestyle and dietary habits, dental professionals may help patients avoid significant restorative work.

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