

# They wear it well

The amount of tooth wear seen among our patients is currently considerably greater than in the past due to the fact that more people are now retaining their natural teeth into old age. Tooth wear is caused by three phenomena: erosion, attrition and abrasion. **Anna Middleton** reports

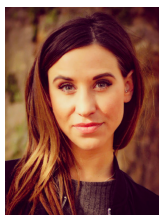
We are always taught to promote good oral hygiene in order to prevent gum disease and dental decay. But how much are we talking about tooth wear and how to prevent it?

I attended a workshop that had five consumers come share their experience of having sensitive teeth and discuss products they had used in the past. As I sat and listened to how they were well versed in applying toothpaste directly to the sensitive area with their finger, I started to wonder if any of them knew why they had sensitive teeth?

None of the five I asked had been to a dental professional to have their sensitivity clinically diagnosed. I quote one of the consumers – ‘I thought having sensitive teeth was the same as having a headache – sometimes you have it and sometimes you don’t. Using sensitive toothpaste was like taking a paracetamol.’

## The reality

I am seeing an increasing number of patients with various types of tooth wear and, what is most concerning, is how young some of these patients are. By better educating our patients, we can protect them from what is often permanent and irreversible damage. Erosive tooth wear is a common and increasing problem, with effects that



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accumulate with age. A recent study showed around 30% of young adults in European countries were affected.<sup>1</sup>

## Types of tooth wear

Despite enamel being the hardest substance in the body when it is lost, the body cannot replace it. The damage is frequently unnoticed by patients so, as clinicians, we need to help protect the teeth from such vulnerabilities and better educate patients.

## Erosion

### Causes

Some 80% of common tooth problems are caused by enamel erosion, and one in two adults have signs. This is the permanent and irreversible damage of enamel through repeat exposure to acids. Extrinsic acids from food and drink, such as alcohol, carbonated drinks (including sparkling water), fruit juices and smoothies are all offenders. Even healthy food and drink can be culprits, along with

stomach acid from gastric reflux, vomiting and bulimia, known as intrinsic acids.

## Signs

**Change in colour:** Teeth may appear more yellow or darker – this is because the enamel has eroded away to reveal the yellowish dentine beneath. As the incisal edges of the anterior teeth become thinner, they begin to appear transparent.

**Change in shape:** Teeth can become more vulnerable to damage as the enamel thins, making them more prone to cracking. This can often be seen as chipped anterior teeth. Posterior teeth will begin to appear flat and broad with depressions on the surface, as the cusps are eroded and the gaps between teeth can become larger. Restorations, especially amalgam, will appear clean and proud as the tooth erodes around them.

**Sensitivity:** This can be caused by several things but one of the most common reasons for sensitivity is through erosion. As the enamel thins, the underlying sensitive dentine is exposed. Dentine comprises many tiny tubules filled with fluid that connect to the nerve. It is characterised as a sudden short, sharp pain or twinges when having something hot, cold or sweet. This is due to the movement of water within the tubules that connects to the nerve, causing pain. Teeth may feel sensitive after drinking alcohol or brushing. Usually the pain goes away but, if it is persistent, it could mean something more serious.

Erosion often co-exists with attrition and abrasion, which we will look at next.

## Attrition

### Causes

This type of tooth wear is caused through excessive opposing tooth-to-tooth contact. We use our teeth constantly. Wear over time is part of natural ageing but excessive wear needs to be identified and treated as this too is irreversible damage. There are several causes, but the most common cause is through bruxism, the constant clenching and grinding of the teeth.

### Signs

**Change in colour:** A yellow appearance of the tooth surface, as the enamel is worn away exposing the darker dentine layer underneath.

**Change in shape:** Mostly seen on incisal edges and occlusal surfaces. Posterior teeth

will lose their cusps and have an altered occlusion. Anterior teeth may appear shorter and the same height, with the incisal edge becoming wider and flat. This can also lead to teeth fracturing.

**Sensitivity or pain:** As the enamel is worn away, the underlying dentine will become exposed, increasing the chances of sensitivity as well as dental decay as it is not as strong as enamel. Tenderness of the periodontal ligament and facial pain can be caused through the occlusal trauma from bruxism.

## Abrasion

### Causes

This is the wearing of tooth structure by friction from objects other than tooth-to-tooth contact. Most frequently caused by incorrect toothbrushing technique with excessive pressure and overbrushing. Increasingly more common now is abrasion through the use of abrasive toothpastes used in the attempt to whiten teeth.

**Change in colour:** The surface is shiny. Abrasion lesions appear darker as the enamel is worn, again exposing the underlying dentine. Sometimes the lesion is deep enough to see the pulp chamber within the tooth itself.

**Change in shape:** Appearing as a saucer-like depression in the tooth, most commonly at the gingival margin and the cervical part of the teeth.

**Sensitivity:** As with erosion and attrition, sensitivity will occur in the same way. There is an increased risk of plaque trapping in the area, which can increase the risk of dental decay and periodontal disease due to the direct contact of plaque to the gingivae.

## Preventing and treating tooth wear

Due to the various types of wear, their causes and how they can intertwine, it is best to take a multi-factorial approach. That way we can identify, monitor, prevent and treat the condition.

First the aetiology factor must be identified. If we can identify the cause, then we can stop or reduce further wear. At every appointment, it is important to analyse the teeth and note the location and severity of any tooth wear.

Taking a detailed social history and diet analysis will also allow for risk factors to be identified. Where appropriate, referrals

can then be made for the treatment of any underlying medical conditions, such as reflux and eating disorders.

Take photos and make study models. This will also allow you to monitor the extent and progression. There are some noted indices used for monitoring changes in tooth wear. However, they lack the ability to measure the rate of progression and are difficult to standardise.

Applying fluoride gels or varnishes can increase enamel hardness and increase resistance to wear and decay.

For patients with bruxism, an occlusal splint can be made to prevent further wear and they should be monitored at regular intervals, along with their appliance.

Restorations may be required to replace or build up lost tooth surface.

## Advice for patients

To prevent erosion, suggest they reduce the frequency of sugar and acid in their diet and suggest they keep these to meal times only, having no more than three to four attacks per day.

Advise that they use a fluoride toothpaste or products with a formula designed to help protect and repair the damage of erosion – spit, don't rinse after brushing. The Regenerate range is designed to promote remineralisation of eroded enamel. The products contain calcium silicate and sodium phosphate, which combine to form a crystal structure that is identical to hydroxyapatite, the key mineral in enamel.

They should avoid brushing immediately after having something acidic or vomiting, as the enamel will be weakened. They must wait about an hour after or brush before. Rinsing with water after can help.

Suggest they use a straw (try to avoid plastic!) to help reduce how much the teeth are bathed in acid. Don't hold drink in the mouth, sip for too long and often, or swirl around the mouth.

Sugarfree gum and mints increase salivary flow, which can neutralise acids, helps remove food debris, help strengthen teeth and increase salivary flow. Opt for product recommendations with Xylitol as an ingredient, as it is clinically proven to help fight dental decay.

Use a soft bristled toothbrush and

advise they brush gently if using a manual toothbrush. Ideally, they should use an electric toothbrush and allow the brush head to glide along the teeth and gum line without scrubbing. Most now come fitted with a pressure sensor in the form of a flashing light or noise when too much pressure is applied. Suggest that they avoid so-called whitening toothpastes. They often contain abrasive particles designed to try to remove staining from teeth. This, combined with an overzealous brushing technique, can wreak havoc on enamel. There is a scale called the RDA scale that grades the abrasiveness of toothpaste. The lower the number, the less abrasive the paste.

### References

1. Bartlett DB **et al.** Prevalence of toothwear on buccal and lingual tooth surfaces and possible risk factors in young European adults. *J Dent* 2013; 41; 1007-1013.
2. Sun Y, Li X, Deng Y, Sun JN, Tao D, Chen H, Hu Q, Liu R, Liu W, Feng X, Wang J, Carvell M, Joiner A. Mode of action studies on the formation of enamel minerals from a novel toothpaste containing calcium silicate and sodium phosphate salts. *J Dent* 2014; 42 (Suppl 1):S30-8.
3. Hornby K, Ricketts SR, Philpotts CJ, Joiner A, Schemehorn B, Willson R. Enhanced enamel benefits from a novel toothpaste and dual phase gel containing calcium silicate and sodium phosphate salts. *J Dent* 2014; 42 (Suppl 1):S39-45.
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\* Based on an in vitro test measuring enamel surface microhardness after three days' combined use of Advanced Toothpaste and Advanced Enamel Serum.

\*\* Acts on early invisible stages of enamel erosion. Helps to regenerate enamel by restoring its mineral content and microhardness with regular use. Clinically proven.

\*\*\* Based on an in situ test of combined use of Advanced Toothpaste and Advanced Serum. Effect compared with calcium silicate toothpaste, standard fluoride toothpaste and non-fluoride toothpaste.

### REGENERATE for the next generation

Erosive tooth wear is a common and increasingly prevalent problem, which affects people of all ages. However, a recent study showed that in the UK, 54% of young adults (aged 18-35 years) have significant tooth wear.<sup>1</sup> Enamel erosive wear is a cumulative process triggered by repeated acid attacks, and the steep increases have been attributed to a rise in ingestion of fizzy drinks, sports drinks, fruits and juices, vinegar based dressings, wines and cocktails. This daily assault on the teeth is most common in the younger generation for whom drinking, snacking and grazing takes place perpetually throughout the day.

However, the public remain concerningly ill-informed about the risks, as a survey amongst 2,000 members of the public conducted by the Oral Health Foundation reveals:

- Knowledge of the other health or lifestyle habits that could have a negative impact on teeth
  - Drinking sports drinks (58%), acid reflux (42%), snacking throughout the day (41%), Bulimia (35%), and drinking sparkling mineral water (15%). Just a fifth (22%) knew that it is all of the above lifestyle habits.
- Knowledge of how dental erosion could affect their teeth:
  - Tooth sensitivity (32%), tooth thinning (28%), tooth yellowing, (20%), tooth cracking (20%), or tooth transparency (17%)
  - Only a third (37%) knew that it is all of the above.

Clinically proven to reverse the early enamel erosion process\*\*

Fortunately, dental professionals now have an effective new tool in their treatment armoury to counter this growing challenge. After conducting a Basic Erosive Wear Examination (BEWE) to determine a patient's risk score for erosive wear, clinicians can recommend REGENERATE Professional Advanced Enamel Serum and Toothpaste to kick start a preventative regime.

Inspired by bone repair research, NR-5™ technology contains two powerful ingredients - calcium silicate and sodium phosphate salts - that combine to form a fresh supply of enamel minerals, wrapping and integrating onto the teeth.<sup>2</sup> Studies showed that the resulting products - REGENERATE Professional Advanced Enamel Serum combined with Advanced Toothpaste can help reverse the early enamel erosion process. It is proven to recover surface micro hardness by 82% following three days of use (in vitro).<sup>3</sup> The REGENERATE Enamel Science system is clinically proven to provide superior re-hardening of acid-softened enamel in situ after three days compared with standard fluoride toothpaste.<sup>4</sup>\*\*\*

For more information, visit [www.regeneratenr5.co.uk](http://www.regeneratenr5.co.uk)

**Oral Health Foundation Research Methodology:** An online survey was conducted by Atomik Research among 2,005 adults in the UK. The research fieldwork took place between 29 March and 3 April 2018. Atomik Research is an independent creative market research agency that employs MRS-certified researchers and abides to MRS code.

