

# Dental Erosion

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*It is only relatively recent that tooth erosion has been recognized as presenting a dental health problem in both children and in adults. In the UK 55% of 6 year olds were found to have erosion and in 23% of this population it had progressed into the dentine.*



**Figure 1.** Erosion due to soft drink intake daily with loss of enamel on buccal surface of both upper central incisors



**Figure 2.** Erosion due to excessive fruit juice intake with loss of enamel on lower incisors and lower canines



**Figure 3.** Enamel loss on mesial surface of upper central incisors

First and foremost one has to understand what dental erosion means. Erosion is the superficial irreversible loss of tooth structure by a chemical process that does not involve bacteria and is caused by acid attack. Erosion usually shows up as hollows in the teeth and a general wearing away of the tooth surface and biting edges. Enamel is the hard, protective coating of the tooth which protects the sensitive dentine underneath. When the enamel is worn away, the dentine underneath is exposed, which is a darker, yellower colour than the enamel, and this may lead to pain and sensitivity. Because the dentine is sensitive a patient's teeth can also become more sensitive to hot, cold or sweet foods and drinks. The teeth also appear highly polished and the loss of tooth surface is generally disproportionate to the age of the subject (Figure 1).

It is equally important to understand the aetiology of dental erosion. Every time one eats or drinks anything acidic, the enamel on their teeth becomes softer for a short while, and loses some of its mineral content. The saliva will slowly neutralise this acidity in the mouth and restore it to its natural balance. However, if this acid attack happens too often, the mouth does not have enough chance to repair itself and tiny particles of enamel can be irreversibly lost. Over time one would start to lose the surface of their teeth.

Dental erosion is multifactorial and the causative factors may be divided into:

## Extrinsic factors

(a) Diet including acidic drinks, energy drinks, flavoured water, sugar-containing sports drinks (Figures 2, 3 and 4).

Acidic foods and drinks such as infant fruit juices, particularly citric ones including lemon and orange, can be particularly harmful to teeth. These generally contain natural acids, which can be harmful to teeth. Fizzy drinks are also a cause of enamel erosion. It is important to remember that even the diet brands are still as harmful. Flavoured sparkling waters should equally be considered as potentially erosive, and preventive advice on their consumption should recognize them as potentially acidic drinks rather than just water with flavouring<sup>1</sup>.

Relative titratable acidity is a more accurate indicator than the pH value when it comes to dental erosion:

- Grapefruit, apple and orange → high
- Soft drinks, wine → medium
- Beer, sparkling water → low

Interestingly it was found that the titratable acidity of energy drinks was greater than that of regular and diet sodas which in turn was greater than that of pure (not from concentrate) juices and sports drinks ( $P < 0.05$ ).<sup>1</sup>

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(b) Habits including occupational exposure to acids.

Erosion has also been reported in swimmers who are in contact with pool water for several hours a week when the acidity of the pool water is below a pH value of 5.<sup>2</sup> Frequent exposure of the teeth to wine, as occurs among professional wine tasters, is deleterious to enamel, and constitutes an occupational hazard.<sup>3</sup>

## Intrinsic factors

- (a) Buffering capacity of saliva;
- (b) Solubility of tooth structure in acid;
- (c) Relationship between hard and soft dental tissues;
- (d) Presence of gastro-oesophageal reflux (Figure 5);
- (e) Bulimia (acid in gastric regurgitation);
- (f) Gastric regurgitation and Cerebral Palsy (patients with cerebral palsy are known to have a high incidence of feeding difficulties, including problems with swallowing and vomiting);<sup>4</sup>
- (g) Gastric irritation due to asthma medication.<sup>5</sup>

Preventing erosion entails the following measures:

- Limit acidic products and fizzy drinks to mealtimes to reduce the number of acid attacks on teeth;
- Drinks should be drunk quickly without holding in or 'swishing' around the mouth. Ideally one should use a straw to help drinks go to the back of your mouth and avoid lengthy contact with teeth. Chilled drinks have a lower erosive potential than drinks at room temperature;
- A meal should preferably finish with cheese or milk as this will help neutralise the acidity content of meals;
- Sugar-free chewing gum should be used after eating to help produce more saliva to help cancel out acids which form in the mouth after eating;

*Frequent exposure of the teeth to wine, as occurs among professional wine tasters ... constitutes an occupational hazard*



**Figure 4.** Enamel loss on mesial surface of upper central incisors



**Figure 5.** Loss of enamel on occlusal surface of posterior molars and premolars due to acid regurgitation

- One should wait for at least one hour after eating or drinking anything acidic before brushing the teeth. This gives teeth time to build up their mineral content again;
- One should brush teeth twice a day with a small-headed brush with medium to soft bristles together with a good fluoride toothpaste;
- Healthy foods such as fruit and fruit juices are not always the best options for teeth if patients have too much of them;

- If antacids are being prescribed the liquid form should be sugar-free so as to avoid dental decay.

Dental erosion does not always need to be treated. With regular check-ups one can prevent the problem getting any worse and the erosion going any further. Study casts of the patient's teeth are prepared to monitor tooth tissue loss and compared at subsequent visits. However in some cases, it is important to protect the tooth and the dentine underneath to prevent tooth decay and sensitivity. In these cases, simply bonding a filling onto the tooth will be enough to repair it. Nevertheless in more severe cases one may need to fit a dental veneer (Figure 5).

In those cases where a medical condition is causing the erosion it is important that the patient's family doctor liaises with the dentist and ensures that the patient is attending for regular dental check-ups. In view of its increasing prevalence we need to be more aware of the diagnostic features, recognise any predisposing factors and diagnose the symptoms at an early stage in order to prevent further tooth loss. [□](#)

## References

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