Tooth wear and care

Professor Andrew Eder describes the causes and symptoms of tooth wear, when and how to treat it, and when it is most appropriate to refer a patient

The Oxford Dictionary of Dentistry defines tooth wear as: 'The non-bacterial loss of tooth substance by abrasion, attrition or erosion.'

So, in clinical terms, what does this terminology mean for the practising dentist?

- **Abrasion** is tooth wear caused by excessive rubbing away of enamel and dentine as a result of, for example, vigorous tooth brushing, porcelain crowns rubbing against the natural dentition or the consumption of a rough diet.
- **Attrition** occurs when there is contact between the teeth over and above what we would consider 'normal' use. Such patients generally suffer from parafunctional activity - grinding their teeth and clenching the jaw at night - which is often linked to stress.
- **Erosion** is tooth wear resulting, for example, from the consumption of acidic foods and drinks or stomach acid regurgitation, which is often found to be a result of conditions such as bulimia nervosa, pregnancy sickness or hiatus hernia.

PLANNING FOR THE FUTURE

Newly qualified dentist, Dr Richard Horwitz, shares his vision of the future when it comes to tooth wear

Dr Richard Horwitz qualified from the University of Sheffield in the summer of 2011. After completing dental foundation training in north London, he has since been in general practice and is a clinical teacher in the primary dental care clinic at King's College Hospital London. He is due to start specialist training in periodontology at the UCL Eastman Dental Institute this September.

How do you see tooth wear affecting dental practice and patients' oral health in the future if things continue as they are?

People are keeping their teeth for longer. Awareness of fluoride treatments in preventing caries and improved periodontal care as well as an ever-growing ageing population are reasons for this. By virtue of keeping teeth for longer, it is logical to assume that tooth wear will affect dental practice more and more in the future.

What do you think needs to be done to meet the challenge of tooth wear by patients and dental professionals?

Education in the population is needed in order to understand the causes of tooth wear and its prevention. Most patients I see are very aware of which foods cause tooth decay. They are often unaware, however, that sugar-free alternative soft drinks, for example, can be very damaging in causing erosion.

Educating health professionals is important so that they can pass on their knowledge to patients, diagnose tooth wear and manage risk factors.

Signs and symptoms

For dentists, the signs and symptoms that indicate a patient may be suffering from tooth wear and that action is needed include:

- Sensitive teeth
- Discolouration, including yellowing and loss of shine (where some of the outer enamel layer has been lost)
- Rounding due to loss of surface characteristics
- Sharp, translucent or chipped anterior teeth
- Occlusal surfaces wearing flat and taking on a shiny, pitted appearance
- Altered occlusion as vertical height changes
- Restorations standing proud of the teeth
- Abfraction lesions developing cervically
- V-shaped notches or shallower cupping present cervically.

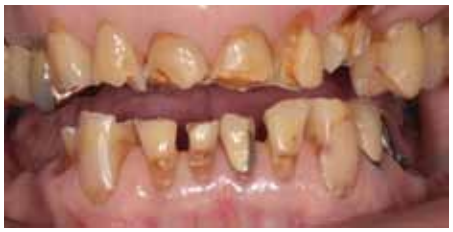
When you do witness such damage, it is important to monitor the rate of wear objectively by taking clinical photographs and study casts for future reference. Then, once the type of tooth wear has been diagnosed - always bearing in mind it is not uncommon for a patient to suffer from more than one form - it is imperative that action is taken to prevent further damage, starting with patient education.

Over-zealous tooth brushing can result in abrasion - where excessive rubbing damages the enamel and dentine. If this is the case, it is a good idea for the dentist or hygienist to demonstrate how to brush the teeth atraumatically, but effectively and, where appropriate, to recommend the use of a soft toothbrush and non-abrasive toothpaste. It is also worth mentioning to patients that foods with a rough texture will make matters worse.

The daily grind

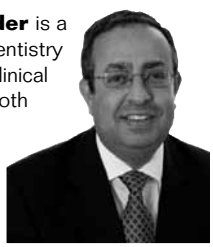
Attrition is often linked to parafunctional activity. If a patient presents with pain and/or tooth wear that can be attributed to grinding and/or clenching and they tell you that they are stressed, it is a good idea to let them know that making a few simple lifestyle changes can be of significant benefit, including:

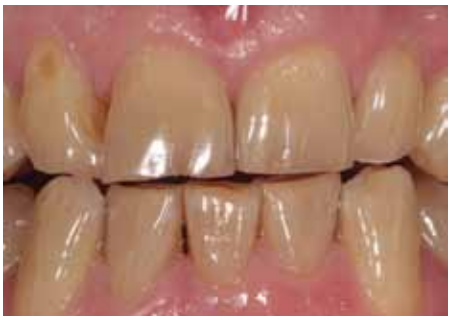
- Doing something relaxing before bed, such as reading or having a bath and switching off stimulants, such as a smart phone an hour beforehand.
- Using essential oils, such as lavender or sandalwood to relax at night and rosemary or frankincense to encourage clarity and provide support during the day.
- Practising yoga, meditation or mindfulness will assist in maintaining an equilibrium so that one learns to cope with external stresses and any subsequent anxiety more effectively.
- Further, prescribing muscle relaxants and the use of a suitable mouthguard, such as a Michigan splint, may prove useful. Such splints

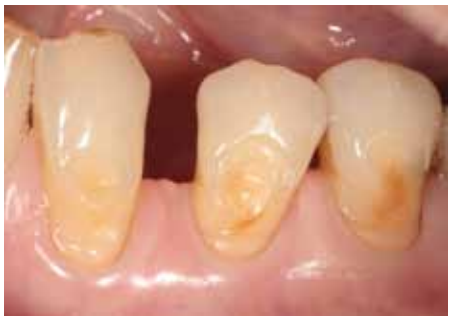


Multifactorial aetiology of tooth wear

Professor Andrew Eder is a specialist in restorative dentistry and prosthodontics and clinical director of the London Tooth Wear Centre, a specialist referral practice in central London. He is also professor/honorary consultant at the UCL Eastman Dental Institute and Associate Vice-Provost (Enterprise) and director of CPD and Short Course Development at UCL.







Left and above: examples of tooth wear

help to protect the teeth against bruxism and reduce TMJ pain by encouraging the patient's mandible to assume the most comfortable and reproducible position. The overall aim with such a guard is to protect against any damage that may be caused by a habitual grinding pattern and to break the cyclical habit, if at all possible.

In addition, recommending care from a physiotherapist or osteopath with specialist knowledge of the temporomandibular joint (TMJ) might be appropriate to increase comfort and prevent further damage.

Erosive potential

As we know, one way in which dental health can be affected is when people consume drinks that they believe are good for their body but in truth contribute to tooth surface loss. Drinks with an acidic pH that can worsen tooth wear levels include sports drinks, fizzy diet drinks and, fruit juices as well as some and cordials and squashes.

Acidic foods cause similar problems. Patients need to know that a number of foods that are generally considered to be 'healthy' have a low pH. Culprits that patients may find surprising include honey, strawberry jam and quinoa.

Patient compliance is crucial, so it is important to raise awareness of what they can do to help themselves at home, including:

- Drinking still water or low fat milk between meals
- Limiting fruit juice to once per day and avoid fizzy drinks
- Keep carbonated drinks chilled as the damaging acidic potential is reduced
- Use a wide-bore straw when drinking carbonated drinks to limit the contact of acids with the teeth
- Swallow carbonated drinks immediately to reduce the contact time with the teeth
- Avoid sipping carbonated drinks over extended time periods
- Don't brush immediately after having carbonated foods or drinks; wait for 45 minutes
- Rinse the mouth after carbonated drinks with water for 15-30 seconds to dilute any remaining acids
- Chewing sugar-free, xylitol-or sorbitol-sweetened gum after carbonated drinks to help neutralise acid in the mouth
- Using a toothpaste that contains at least 1,400ppm fluoride and a non-abrasive toothbrush
- Use a fluoridated mouthwash daily at a different time to tooth brushing and/or before consuming carbonated drinks to help limit the erosive potential.

Medical aspects

Medical conditions such as bulimia nervosa, pregnancy sickness or hiatus hernia as well as bariatric surgery may result in frequent regurgitation and the potential to cause damage as a result of stomach acids coming into regular contact with the dentition.

Extended periods of intentional vomiting suffered by bulimics, for example, have considerable impact on the dentition and can result in substantial oral health complications. Denial and shame are strong features of eating disorders, so the patient may not readily admit to their behaviour. Because of this, it is important to share examination findings with

EDUCATION AND SUPPORT ARE KEY

Dr Charlotte Leigh, currently in her first dental foundation year, considers her role and that of her peers in the years to come

Dr Charlotte Leigh graduated from the University of Leeds in 2012 and has been undertaking her DF1 at Hatfield Peverel Dental Surgery as part of the Ipswich Scheme. She is looking forward to starting her DF2 at Luton and Dunstable Hospital next year.

How do you see tooth wear affecting dental practice and patients' oral health in the future if things continue as they are?

During my first dental foundation (DF) year, I have found that I am increasingly seeing more patients presenting with tooth wear. There is often a lack of awareness and education on behalf of the patients of the effects of certain foods and habits on their teeth. Most of these patients believe they are leading very healthy lifestyles, for example, by eating lots of fruit and using diet drinks, however they often don't realise the consequences of these to their oral health.

Previously, tooth wear was commonly associated with older patients but it is now becoming increasingly prevalent amongst younger people. These young patients, who may have a minimally restored or intact dentition, may be forced to enter the restorative spiral earlier either due to an aesthetic or functional concern.

Recently I have diagnosed several young men with widespread erosion from fitness and sports drinks used continually during their training. Patients are often shocked to discover that they have extensive tooth wear, which they were previously unaware of, and surprised to learn of the need for treatment.

What, if anything, do you think needs to be done to meet the challenge of tooth wear by patients and dental professionals?

I am often apprehensive about treating tooth wear cases, along with many of my peers, because we are taught that they are challenging to treat and we have a lack of experience in caring for these patients. It would be hugely beneficial to have more support available from specialists and experienced practitioners to assist us, as young dentists in general practice, in developing the confidence and the skills needed to handle these cases.

I also believe that, since prevention is better than cure, we need to increase education for both patients and dentists. If patients are better educated about the impact of diet and habits on their oral health they can modify their lifestyle, enabling the dentist to monitor tooth wear and prevent further treatment. In conjunction, if we as dentists are better informed and more confident about diagnosing tooth wear, we can inform patients of all the risks and consequences of their lifestyle on their oral health.

As more CPD courses and literature become available, young dentists are growing more aware of the increasing problem of tooth wear and the future challenges we will face.

PROMOTING A HEALTHY LIFESTYLE

Soon to finish her VT year and with a variety of clinical experiences under her belt, Dr Alexandra Day expresses concern that the modern lifestyle is exacerbating tooth wear.

Dr Alexandra Day graduated from the University of Sheffield in 2012. She has a special interest in tooth wear and working with anxious patients. She is currently coming to the end of her VT year in a mixed NHS/private practice in London. Alexandra is the current chairwoman of the Central London VT scheme and an active member of both the British Academy of Cosmetic Dentistry (BACD) and the International Academy of Aesthetic Facial Academics (IAAFA). She is an ambassador for the Heart Your Smile campaign in the UK and the Dental Community Fellowship in the USA

How do you see tooth wear affecting dental practice and patients' oral health in the future if things continue as they are?

It is clear that tooth wear is on the increase, with reports of more than 75% of adults and 50% of children presenting with signs of erosion, attrition and/or abrasion. The most significant increase in tooth wear over the last few years has been seen in young adults. This is of particular concern given that the modern lifestyle is resulting in loss of tooth tissue surpassing that expected for the patient's age.

As a practitioner, what is of greatest concern to me is the lack of patient awareness and education as to how lifestyle choices affect oral health. The younger generation is presenting all too frequently with erosion caused by acids found in soft drinks, citric fruits and many condiments.

Marketing and mixed messages appear to be leading to a state of confusion, with many patients opting for so-called 'health and diet drinks', partly as a result of the pressures of the '5-a day' fruit and vegetable campaigns. Yet many patients are completely unaware of the acidogenic potential of the supposedly healthier options, including many fruit juices, smoothies and flavoured waters.

Other aetiological factors that appear to be contributing to tooth wear in this age group are eating disorders, including anorexia and bulimia nervosa, stress-related bruxism, and aggressive tooth-brushing techniques.

If changes are not made and the educational messages not pushed forward, the future, inevitably, will see more and more young patients with occlusal problems, heavily worn dentitions, and complaints of sensitive, discoloured and chipped teeth.

What do you think needs to be done to meet the challenge of tooth wear by patients and dental professionals?

Having graduated from dental school only recently, and having spoken to other recent graduates, I feel that the undergraduate curriculum does not adequately prepare new dentists to prevent, diagnose and manage tooth wear cases. Given the prevalence of tooth wear, I believe that it should have greater weighting in the syllabus. My observation from undergraduate clinics is that there is no clear understanding of, or identification between, physiological and pathological tooth wear.

In the past, I think that tooth wear has been very much overlooked, with little in the way of monitoring and prevention. What we are seeing now in practice, and what we will undoubtedly continue to see without any intervention, are patients with moderate-to-severe tooth wear with loss of clinical crown height and alveolar compensation, or loss of vertical dimension with unfavourable, unstable occlusal schemes. At this point, management is often complex and may well require referral for specialist care, something that can be quite daunting for patients.

the patient in a sensitive manner, explaining what typically causes excessive acid in the mouth.

Oral health advice for a patient whose dentition is compromised by frequent regurgitation includes:

- Issuing a fluoride rinse or gel and prescribing a high-fluoride toothpaste for daily use
- Not brushing immediately after vomiting or consuming acidic foodstuffs, but rinsing with a fluoridated mouthwash or water and chewing sugar-free, xylitol-sweetened gum afterwards.

Those regularly taking recreational drugs may present with evidence of a very specific pattern of parafunctional activity which can result in tooth wear involving just a few teeth. It is often difficult to replicate the apparent tooth contacts that should draw attention to this as a possible cause.

If you do discover that a condition beyond the usual scope of dental practice is contributing to tooth wear, it is prudent to liaise with the patient's GP/specialist before taking further action.

The treatment phase

Once you are satisfied that the patient is stable and has taken action at home to stop their tooth wear progressing, remedial treatment can begin. For those with minimal damage, adhesive techniques are indicated to protect the worn tooth surfaces and provide the patient with aesthetic and functional improvements.

It is clear that if damage resulting from tooth wear is not diagnosed and addressed in its early stages, treatment may need to include extensive restoration to correct the situation. When a patient presents with particularly troubling issues or appears to require complex treatment, referral to a specialist may be recommended to ascertain what is in the patient's best interests and/or to provide treatment.

Upon completion of treatment, regular check-ups are necessary to discuss the patient's progress, monitor the rate of wear, provide further motivation and guidance and support adjustments to lifestyle.

Opportunity knocks

As shown by the experiences of our newly qualified colleagues (in the box outs), dental professionals should consider themselves on notice. The Adult Dental Health Survey 2009 states: 'The greatest increase (in tooth wear) was in the youngest three age groups; 15%, 10% and 13%s for those aged 16-24, 25-34 and 35-44 years respectively. While the increase in moderate tooth wear is small, moderate tooth wear in 16 to 34 year olds is of clinical relevance as it is suggestive of rapid tooth wear.'

It is true that tooth wear is a natural part of life and it gets worse as we get older, and so it is fair to suggest that suffering some tooth wear is unavoidable. However, a number of causes of tooth wear are preventable – at least to some extent. Because of this, all dental professionals can make a difference to their patients' susceptibility to and awareness of tooth wear.

Irrespective of age, patients need to be informed that imprudent food and drink choices, medical conditions that induce regurgitation, stress-related bruxism, and over-zealous tooth brushing can all cause damage to the enamel and dentine.

Early diagnosis of tooth wear is essential so that simple treatments, including monitoring and prevention, may be provided to help patients achieve enamel and dentinal longevity. Left unaware, patients may continue with their destructive habits, which will have serious implications for their oral and dental health -they have entrusted you with-in the years ahead. ■

The London Tooth Wear Centre offers an evidence-based approach and comprehensive care utilising the latest materials and clinical techniques. For further information visit the website at www.toothwear.co.uk, email info@toothwear.co.uk or call 020 7486 7180