

First, do no harm

John Craig and Martin Kelleher argue that addition beats subtraction when it comes to the management of tooth wear

For for many years we have written and spoken out against some of the destructive excesses of modern, supposedly 'restorative' or 'cosmetic' dental practice, one as a concerned Scottish GDP, and the other as a consultant in restorative dentistry.

We had thought that such destructive methods were becoming less prevalent in modern dentistry, but apparently not so. We, therefore, write to challenge several of the points expressed in a recent article. This peculiar article demonstrated mild upper anterior tooth surface loss with a mild postural class three adaptive position, which is often found when the loss of upper incisor height has been due to chemical erosion. We disagree strongly that this picture showed 'severe wear' as was stated in that article.

As a general rule in tooth wear assessment, if the crown heights of the upper anterior teeth have been preferentially shortened, but the height of the lower teeth have not been equivalently affected, experienced clinicians can usually be fairly sure that the upper tooth surface loss has been caused mainly by chemical erosion. This is because the lower teeth are generally spared from most of the damage caused by the damaging erosive acid fluids, during either extrinsic or intrinsic acid attacks, by the protective action of the tongue.

The tongue lies over the lower teeth during the swallowing of acidic fluids, or during any sort of regurgitation and thereby keeps most of the

erosive acids away from the lower teeth but allowing the damaging acids to attack the top teeth and thereby shortening them so that their height to width ratios are reduced disproportionately and they then look 'short and wide'.

In the recently published case report, the heights of the upper anteriors appeared to have been preferentially reduced to the extent of them being about the same as their width. By way of contrast, the opposing lower teeth still appeared to be a normal shape and have a significantly greater height than their width – which is usually the case in healthy unworn lower incisor teeth.

This contrast in the opposing dental arches clearly pointed to chemical erosion as being the most likely explanation for this particular case presentation, because, if the tooth surface loss had been due to physical attrition, then the much smaller lower incisors would have been worn preferentially, or at the very least equivalently, to match the tooth surface loss apparent at the upper incisors. By way of illustration of this important differential diagnostic point, two images

from a different case, this time actually showing severe preferential tooth surface loss caused by Coca Cola erosion are shown in Figures 1a and 1b.

Sadly, in our view, it is not infrequent to still see this sort of failure of accurate diagnosis of the probable aetiology for shortened upper teeth before then proceeding as shown in that recent case report with what, in our sincerely held opinion, was an unnecessarily destructive treatment plan involving multiple ceramic veneered full coverage crowns for this mild wear problem.

Many of these cases appear to us to be sometimes done for rather questionable 'cosmetic' benefit or to conform to some unproven, or unscientific, occlusal belief system sometimes involving articulators of varying complexity being used in order to treat tooth surface loss problems.

Parts of the Hippocratic Oath include: "Firstly, or most importantly, do no harm", but also exhort that: "Extreme remedies should be reserved for extreme diseases." Mild tooth surface loss is not an extreme disease. Elective removal of much residual

sound tooth tissue undoubtedly does structural and other biologic harm, often involving processes that are not benign, not trivial and not reversible.

High speed drills with diamond burs are dental weapons of mass destruction and every seriously destructive preparation of an already worn tooth will probably shorten its life. Although the ceramic veneered crowns may well look pretty at the start of their life, that aesthetic or biologic picture will probably look worse in 20 or 30 years time with a poor 'fall back position', sadly, for the patient.

We honestly believe that most experienced dentists when treating mild wear would not remove vast amounts of residual sound tooth tissue from their own daughter's teeth¹, from a colleague's teeth, nor indeed have it removed voluntarily from their own teeth. There is no articulator system in the world that can compensate a tooth for hazarding its pulpal health with an elective full coverage crown preparation² or for the loss of 62-73 per cent of its load bearing structure, which has been shown by Edelhof and



Fig 1a & b

The tooth surface loss is greater at the upper teeth so that they appear shorter and wider. The lower incisors have a normal height-to-width ratio. This problem was caused by chemical erosion rather than by attrition

Sorenson³ to be what happens with full coverage preparations for ceramic veneered crowns.

We feel strongly that many experienced dentists would recognise that most sane patients would reject the destructive options if those known figures mentioned above were explained to them in advance, and in writing, in order to obtain their informed consent for the 'dental destruction' illustrated in these case reports, especially given that there were other viable, non destructive options available to them.

For instance, instead of this irreversibly damaging porcelain pornography⁴ some direct composite bonding applied to the upper incisors to lengthen them and composite additions to the canines to reintroduce canine guidance, would have predictably changed this sort of 'pseudo class three' into a class one occlusion in relatively short order, but without taking any pulpal risks or doing any structural damage to these teeth.

If the colour happened to have been an important issue for the patient then, again in our view, conventional night guard vital bleaching with 10 per cent carbamide peroxide could have sorted out that perceived colour problem safely and predictably in advance of some non destructive direct resin composite bonding being done to change the shapes of the teeth.

Such an additive rather than destructive approach can sort out these apparent tooth surface loss problems, probably in a few visits, with minimal biologic or structural damage being done to the shortened upper teeth.

Direct resin composite bonding would probably have been predictable, because the composite resin material indicated here only needed to be resistant to further acid attack, the source of which should have been determined prior to treatment. By way of contrast to the destructive philosophy, a different case with moderate



wear is shown in Figure 2a-d (above) being treated with an 'additive approach' rather than a 'subtractive' one.

In spite of these alternative, biologically sensible approaches being proven^{5,6,7} and readily available, we are very perturbed to see case reports using an outdated and grossly destructive full coverage crown approach to these mainly structurally sound upper teeth, to produce a questionable biologic and 'cosmetic' result under the guise of using a semi adjustable articulator.

In these cases, the 'air rotor attack' does more damage in one visit than many previous, or successive years of wear might have caused, if the erosive acid attacks had been identified in order to eliminate them.

This sort of aggressively destructive treatment for the apparently mild tooth surface loss was and remains, in our sincerely held opinion, the wrong treatment from a biologic perspective. We believe that it can result in about 40 more years of structural damage being done by a dental bur in a short period of time. This was something that

we feel can not now be justified ethically, or biologically, given our modern understanding of the longer term biological costs of damaging worn but mainly sound teeth.

The adaptive class three shown here was probably just that - adaptive - and in our experience this occurs as a

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John Craig, BDS, DGDP(UK), FFGDP, FDS (RCSEd), qualified in 1966 and was a GDP for 40 years, mainly in Falkirk. He had a long involvement with postgraduate dental education in Scotland and was chair of SDVTC for seven years. As chair of the steering group which set up the FGDP in Scotland and the first Director of the West of Scotland Division, he was instrumental in laying the foundations of the FGDP in Scotland. He was a member of the BDA Rep Body/Rep Board for many years, vice-chair of the BDA Executive Board and President of the BDA in 2005. In 2003 he was awarded an FDS (ad Hominem) by the Royal College of Surgeons of Edinburgh.



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result of slow hard tissue loss and the periodontal ligament mechano-receptors programming the neuro-musculature around the mandible to move the teeth forward more to an edge to edge relationship in order to improve function.

However, once one opens the anterior vertical dimension with direct resin, or other restorations, the lower teeth usually move back quite soon in to class one as the condyles move upwards and backwards quite quickly, and then other tooth movements occur to establish a new intercuspal position over time^{5,6,7}. Localised increase in anterior vertical dimension is sometimes described as being a 'Dahl principle'⁶, but adaptation by dentate patients to increasing vertical dimension with restorations, was described by Anderson as long ago as 1962⁹.

In our opinion, given the now well documented evidence for these scientifically proven minimally destructive approaches, it is very worrying for the profession at large and the patients in general to see this sort of old fashioned iatrogenic damage still being published under the guise of using articulators to optimise the subsequent crown restorations.

This sort of destructive preparation for crowns in wear cases was common in the 1970s⁸ and 1980s when that was all that was available for us to treat this sort of problem.

The sort of treatment shown in these articles pre-dated predictable adhesive dentistry, or our understanding of differential diagnosis of causes of tooth surface loss, and when treating various sorts of problems without further damaging the teeth was rather less well developed than it is now¹¹. ■

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