

Letters to the editor

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Restorative dentistry

Of little consequence

Sir, I write in response to the letter *Centric concerns* (*BDJ* 2021; 230: 495) that commented on my paper *Centric relation and increasing the occlusal vertical dimension* (*BDJ* 2021; 230: 83-89). In response to the comments regarding the case in question, this was not discussed in detail as the focus was on centric relation and the vertical dimension. It was clear that the tooth surface loss was multifactorial in nature with parafunctional, abrasion, abfraction and erosive elements. It was clearly stated that there was bruxism with current symptoms of TMD. There was increased wear to the anterior teeth due to an initial edge-edge occlusion and tongue thrust. There was wear into dentine of all the occlusal surfaces of the upper teeth. The 26 had a large temporary dressing and the 16 had a large multi-surface amalgam and apical pathology requiring root canal treatment. It was not a simple erosion or localised anterior tooth surface loss case that could be simply treated with composite or a Dahl approach.

He had previously been restored elsewhere with composite on at least two occasions, involving both the upper and lower anterior teeth, which had failed to meet his aesthetic aspirations but he also stated that they had 'all stained' (he was a smoker) 'chipped' and then 'fell off' within a year. He was reluctant to receive further composite rehabilitation and also had very high aesthetic demands as stated in the article.

I unfortunately encounter many failed composite and ceramic cases due to occlusal issues and parafunction as well as outdated composite techniques. I have adopted the Bioclear composite technique which has dramatically reduced complications and maintenance.¹

Key principles of the Bioclear technique:

- Particle abrasion for increased bond strength

- Bulk fill monolithic overfill of warmed composite and cut back
- 2 mm thick incisally
- Infinity edge margin
- Polishing protocol
- Composite wrap around in challenging situations.

A comprehensive risk-based examination of the occlusion and TMD is essential in all wear cases as this significantly impacts on treatment options and prognosis.²

The reason for premature restoration failure in this case was the patient's parafunction (with increased prolonged loading of the restorations) and a class III edge to edge occlusion, both important risk factors³ and traditional composite techniques.

The principle reasons for restorative intervention in wear cases is to either improve aesthetics or protect vulnerable dentine or both (it is more uncommon that there are functional issues or significant sensitivity). In this case, both additive composite techniques and indirect restorations were utilised to satisfy these requirements.

I first published on minimally invasive composite techniques 20 years ago⁴ and have published numerous clinically relevant articles on minimally invasive restorative techniques utilising both composite and ceramic.⁵ It is widely accepted that in more advanced wear cases in aesthetically demanding patients a combined approach or purely ceramic approach may be the preferred option for the patient if delivered in a biologically controlled fashion, as in the case in question.^{6,7}

The patient's primary concern was aesthetic improvement (patient wishes are integral to Montgomery consent), in particular the upper incisors and returning these to their original length, proportions, value and also minimal maintenance and restoration longevity. After a full consent process, he elected for a more comprehensive risk-based approach to achieve

these desires increasing the vertical to allow the return of the incisors to their original length. This required a vertical dimension increase due to the supra-eruption of the anterior teeth and the class III edge-edge occlusion but also allowed improvement to the occlusal scheme establishing a more protective canine guidance. It should be obvious that failure to address the above issues would again lead to premature failure of any anterior restorations regardless of material used.

Both additive composite and indirect restorations were utilised in a combined approach. After much persuasion the patient accepted additive direct composite to the lower anterior teeth which were less visible. This involved composite 'wrap around' (due to the risk factors previously highlighted) to improve retention and resistance form and provide a greater area for bonding. This also provides more compressive loading of the restorations in this challenging environment.⁶ To increase the vertical dimension and protect exposed dentine, the upper premolar teeth were restored with no preparation direct composite onlays (delivered via the stent of the diagnostic wax). Both first molars required cuspal coverage which was provided by a minimal preparation indirect onlay and full coverage metal ceramic crown with metal occlusal surface.

Full coverage highly aesthetic monolithic ceramic restorations are a fully acceptable treatment option for a patient in their 50s with a great deal of pulp canal obliteration, who has very high aesthetic expectations and declines composite due to previous failed interventions. As with the lower composites, wrap around was indicated for the reasons previously listed and also the large amount of buccal cervical root surface cementum, which precluded facial-incisal composite or ceramic veneers. This is risk analysis of the occlusion and individual teeth, which should always guide treatment choices and preparation design for greater tooth and restoration longevity.

IPS e.max is widely recommended due to its high strength and excellent aesthetics.⁸ The Mesko *et al.* study is quoted but this actually endorses the inclusion of crowns as a legitimate treatment option for tooth wear. These should obviously be delivered in a minimally invasive and biologically controlled manner which was done in this case. Whilst composite is certainly the first choice of material in many wear cases it is naïve to think that composite is appropriate in all situations, particularly as the wear advances and in older patients with high aesthetic demands and previously failed composites. As the majority of more advanced wear cases are likely to be treated privately in the UK, it is not surprising that many of these patients are more aesthetically demanding, as this is what drives them to seek rehabilitation.

The protocol for the 360-degree veneer technique encompasses the use of modern ceramics and protocols to minimise tooth reduction, preserve pulp vitality and provide highly aesthetic durable restorations. The technique involves:

- The use of press and stain only high strength monolithic e.max
- Preparation with the speed increasing handpiece with high water
- Biologically-controlled preparations with a silicone index from the wax up or a bisacyl prep through guide to ensure the preparations are as minimal as possible⁹
- A modest expansion of the arch form to minimise buccal preparation
- Particle abrasion and Pashley sealing immediately after tooth preparation¹⁰
- Adhesive bonding protocols for the final restorations.

Pulp death is obviously a concern with full coverage restorations, with Saunders and Saunders recording high rates of pulp death (19%) in crowned teeth, but it was suggested that many of the crowns were for metal ceramic and would have been provided on the NHS. They also highlight inadequate cooling and faulty or worn equipment as possible risks to the pulp. They also suggest that resin bonded crowns may mitigate this risk,¹¹ in essence the 360-degree veneer concept. Other studies show that low rates of pulp death can be achieved with studies demonstrating that 92% of vital crowned teeth remained free from pulpal damage at ten years.¹²

Whilst requiring elimination of undercut for a path of insertion, these monolithic

shells require as little as a 0.3 mm minimal chamfer and 0.6 mm axial reduction. As with composite restorations, the risk lies with these high strength ceramic bonded monolithic shells, not the tooth. Having provided these restorations for nearly 15 years, I have experienced no pulp death or tooth fracture and 100% survival (one severe parafunctional case experienced restoration chipping which could be smoothed). The wrap around provides superb resistance and retention form in more challenging parafunctional and occlusal situations.

The term 360-degree veneer is wholly appropriate to describe these minimal preparation high strength ceramic shells as it distinguishes them from more destructive metal ceramic crowns/early all ceramic crowns. There is virtually no incisal or palatal reduction required for the full wrap around and high success rates of 90% over five years have been demonstrated for ceramic restorations in the anterior segment in tooth wear cases.¹³

In regard to their consideration of the literature and criticism of my first article, the reference to the Kelleher article is seriously flawed as this article deals with the use of composite in mild to moderate erosion only, where a very modest OVD increase is required. I have previously published on this seven years ago.¹⁴ It is stated clearly that the centric relation articles are concerned with moderate to severe tooth wear. The Kelleher article deeply concerns me as it fails to consider the often complex multifactorial aetiology of more advanced tooth surface wear in older patients. There is no mention of the influence of parafunction or occlusal issues such as restricted envelope of function or class III occlusions, which predispose to tooth wear and have a major impact on risk-based planning and prognosis. These cases require more thought than simply composite bonding with no occlusal consideration. Their vague criticism is of little consequence and I have actually received very positive comments regarding these articles and their considered nature and clinical value in moderate to advanced tooth wear.

The citing of the Burke and Lucarotti study regarding longevity of crowns is of little relevance to contemporary private practice as it is based on NHS data for mainly heavy preparation metal ceramic crowns with no Pashley sealing technique, no biologically-controlled preparation and cementation with traditional soluble or weak cements. The inclusion of this study is naïve at best.

The misleading nature of this reference is in fact demonstrated by Burke and Lucarotti¹⁵ in regard to NHS veneer provision in England and Wales, where only 53% of veneers survived for ten years without re-intervention. Conversely, veneer provision by an experienced private practitioner demonstrated a failure rate of only 7% for 3,500 veneers over a ten-year period.¹⁶

It is worth noting that many of the composite studies apply only to anterior Dahl appliances or mandibular anterior teeth, the least demanding composite situations. A more representative study of rehabilitation of tooth wear found survival rates of only 62% for traditional composite, but 74.5% for indirect restorations with failure generally due to fracture and staining.¹⁷ This is a large amount of repolishing, resurfacing, re-appointing or replacement of traditional composites with costs to the patient or clinician. Fortunately, with the Bioclear composite system these complications can be significantly reduced.

Their lack of fundamental occlusal insight, questionable use of the literature and lack of recognition that a range of risk-based restorative techniques should be considered in more advanced tooth wear is concerning and disappointing.

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Coronavirus

P2 Surgery: Crisis...what crisis?

Sir, for those involved in cancer care it is clear that our patients have been the collateral damage of this pandemic. There have never been more patients waiting 104 days for their cancer treatment.¹ This has consequences; even a four-week delay causes a 13% increase in mortality.² To mitigate this, NHS England published guidance (P1, P2, P3 and P4 categories) for those with the greatest healthcare need. This has been to ensure P1 and P2 cancer surgery is prioritised alongside patients with COVID-19.³ However, this national strategy has been implemented at a local level, where there are substantial differences from region to region. This variation has not aligned with either cancer or COVID-19 demand. Instead, this has been due to the ability to escalate beds and surgical capacity.⁴

The main increases in capacity have been the independent sector and the creation of cancer hubs. Some regions have more private hospitals, so finding additional operative capacity is relatively easier.⁵ The development of cancer hubs has helped some regions, but not equitably. For instance, the North West region has seen a 188% increase in their 104 day breaches versus London at 98%.¹ Between specialities, there exists a large difference in activity too, with head and neck cancer (HNC) being one of the greatest affected. Dentists, the largest referral base for HNC, have seen a reduction in activity to 25%, compared to 2019 resulting in a 55% decrease in such referrals in April 2020 compared to 33% for lower GI malignancies.⁶

Whilst the strategy for priority triaging of patients has been well intended and needed, it has failed to take into account regional variations of services and different specialities. The success of the vaccination programme

makes it easy to believe that these are historic problems. However, the government has modelled for a further wave in the autumn.⁷ If this is the case, then we may well see further inequity between cancer patients.

How we go about tackling this is not straightforward, and there is no silver bullet. However, the time to have this conversation is now. National strategy and guidance is one thing, but without thinking local and speciality specific, we will fail to tackle this crisis.

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Disposable or not?

Sir, I work for the Community Dental Service (CDS), have been fit tested for, and provided with, disposable FFP3 respirators. From discussion with colleagues in general practice and reviewing manufacturers' claims, reusable respirators potentially provide some advantages which include:

- Relatively comfortable to wear for long periods (although not all would agree!)
- Easy to clean
- Reusable therefore economical and reduces environmental pollution
- Easily changeable HEPAC filters
- Positioning of expiratory valve reduces misting of visor.

I therefore approached the Infection Prevention and Control (IPC) lead in my employing trust to seek approval for the introduction of these masks in to our CDS. I was somewhat surprised by the response which effectively actively discouraged their use. The IPC view was that '*despite claims from manufacturers, these masks have not been designed for use in healthcare. As such their ability to be easily decontaminated has not been thought out with IPC in mind. The materials or fabrics used and the complex design conflicts with decontamination.*'

This response presented a dilemma. Either the reusable masks are a suitable product, in which case they should be available to all dentists and DCPs, irrespective of branch of dentistry, or the limitations should be clearly set out and their use either prohibited or restricted to very specific circumstances. I was pleased to receive the *NHS Dentistry and Oral Health Update* dated 25 February 2021 (NHS England) with details of a new service to deal with PPE-related complaints and enquiries (ppe.complaintsandenquiries@nhs.net). Contact with them provided a prompt response containing the following link with relevant, important information: <http://www.medidex.com/research/866-reprocessing-of-respirator-masks-covid19.html>, leading to the UK Decision Making Committee on PPE (DMC) interim advice paper.¹ Key points (available in more detail via the link) are:

- Reusable half mask respiratory protective devices (P3 respirators) are generally used outside of a healthcare environment, however, they may be used when healthcare workers cannot pass or complete a fit test with single use respirator face masks, but are able to pass a fit test with a reusable respirator. This is particularly true for individuals with small faces, especially women
- Reusable respirator masks are usually intended for use in a non-clinical environment – they are intended to protect against dust and particulate matter rather than microbiological challenges
- They are not usually intended to be decontaminated after microbiological contamination
- There is no currently agreed standard for decontamination of such masks and therefore a UK PPE Decontamination Group is working with industry to develop guidance on appropriate methods