

View from the bench



Adriaen van Ostade: 'An alchemist'

Dental technician Peter Wagon explains the myriad of metal-free restorations currently available and explores their use in modern dental practice

In mediaeval times, the finest minds of the era could be found in the towers of castles, searching for the secret formula that would turn base metals to gold.

Of course these alchemists failed in their quest but their modern equivalents, now in the research laboratories of German and American dental companies, have had more success making precious metals and gold disappear from crowns and bridges. They have come up with a myriad of techniques and materials that all promise in their glossy adverts to be the answer for metal-free restorations. In this article I will try to explain what they are and what I think they can do.

Metal-free crowns

Metal-free crowns are not entirely new. I first started in ceramics 30 years ago, making platinum jacket crowns (PJs). Although weaker than metal-bonded crowns, with the right case one could get fantastic

aesthetic results at a reasonable price without the laboratory having to buy expensive CAD/CAM or pressing systems. But following the discontinuation of an all-important element of the PJC, it was consigned to history along with Betamax videos, the cassette tape and the alchemists.

So what have the boffins in white coats given us to replace the PJC? We now have some pretty exciting products, with superior vitality and biocompatibility to bonded crowns. These now fall roughly into two categories: pressed or CAD/CAM restorations.

Pressed ceramics

Pressed ceramics, Empress and Empress 2, have been around since the late 1980s. They have advanced and become a lot less technique-sensitive in the intervening years with the arrival of Empress E-max. They are made using a lost wax technique similar to traditional gold work. The


restoration is initially made in wax, either to full contour or as a base for porcelain to be added to, and then invested. The wax is burnt out in the furnace before an ingot of lithium disilicate of the right shade and translucency is pressed under vacuum into the mould. The restoration is then finished and glazed by the ceramist. We have found that we get excellent results for veneers, inlays, crowns and bridges using this technique.

CAD/CAM

CAD/CAM technology has really taken off in the past decade, with new software being developed all the time. Most labs should be able to offer some sort of CAD/CAM crown as there are milling centres popping up all over the world offering copings to smaller labs. We felt that we wanted our own in-lab system, which gives us full control over quality, pricing and turnaround times.

The copings that porcelain can be layered upon fall into

four groups, each with their own qualities and indications:

1. Spinnel is suitable for single anterior crowns where the underlying prep is not discoloured, as it is the most translucent material
2. Alumina is a similar material to the original In-Ceram, first introduced in 1989. However, the factory-produced CAD/CAM blocks are more consistent and stronger than the laboratory mixed slip and can be more quickly produced, as the slip needed two furnace firings adding up to 16 hours. Alumina is suitable for anterior crowns and up to three unit anterior bridges
3. Zirconia is even stronger, and ideal for posterior crowns and bridges
4. YZ-zirconia is yttrium-stabilised zirconia and the strongest of the lot. Marketed under the trade names Lava, In-Vizion and Procerra, it is nicknamed 'ceramic steel' and is tough as old boots, suitable for large span bridges throughout the mouth. 

Peter can be contacted at Associated Laboratories Ltd, Day Lewis House, 324 Bensham Lane, Croydon, Surrey CR7 7EQ, England; tel: +44 (0) 20 8689 2905; email: allden@aol.com; web: www.theteethpeople.co.uk.