Working with composites

Although there are many composite materials on the market, it’s not necessarily the performance of the material that is most important, but the skill in carrying out restoration, says Dr Gordon Penman

For the past few years, I have been using Esthet-X from Dentsply as my material of choice for anterior and posterior composite restorations. This is a visible light-cured, radiopaque composite restorative material. I also use X-flow, which is another Dentsply product, for any situations where I feel that a flowable composite is indicated.

A composite is a material that consists of two or more components, and a dental composite contains inorganic fillers that are incorporated into a resin matrix. The filler particles mainly confer the required physical properties of the material such as strength, modulus of elasticity, polymerisation shrinkage, co-efficient of thermal expansion and water sorption.

Esthet-X utilises barium alumino-fluorohydroxysilicate (BAFG) with silicone dioxide particles as the filler, and these are embedded in a resin matrix which chemically is made up of bis-GMA adduct, ethoxylated bisphenol-A dimethacrylate and triethylenglycol dimethacrylate (TEGDMA). The material also contains photoinitiators, stabilisers and tints. The TEGDMA is added to dilute the monomer, which is very viscous. This makes the resin easier to use.

Esthet-X contains 77.5 per cent filler by weight and 60 per cent filler by volume. The average particle size is 0.7 microns and it is classed as a micro hybrid composite.

Know your material

As with any material, there is a learning curve that needs to be negotiated before one can utilise the material to maximise its optimum performance. I feel that perseverance is justified as I am becoming increasingly confident of achieving good quality, aesthetic restorations with Esthet-X.

The composite handles well with minimal stickiness to instruments and little slump. This allows it to be sculpted into the desired anatomical form, which I like. There is a wide range of opaque, body and enamel shades which facilitates a layering technique to fabricate a restoration which closely resembles natural tooth in appearance.

The shade guide, although at first quite daunting in complexity, provides a ‘recipe’ card, which advocates the mix of shades which should be chosen to build a restoration that will have the desired shade and translucency.

Choosing a colour

For small cavities, simply selecting the body shade gives a relatively quick and aesthetically pleasing result. More extensive restorations where there has been extensive tooth tissue lost, allow the use of the opaque, body and dentine shades to create an extremely life-like restoration.

In the kit, the compules are colour coded for easy differentiation and identification.

I use a Ronvig composite warmer to pre-heat the Esthet-X compules. I find that this allows me to place the material more easily into the prepared cavity and studies suggest that pre-warming composite enhances the conversion rate and produces a more highly cross linked polymer network. It is suggested that this should improve the mechanical and physical properties of the final restoration.

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The finishing touches

Achieving a smooth, well-polished surface can improve the longevity and aesthetic success of a restoration by decreasing plaque accumulation and surface stain. Having a smooth surface is also less likely to cause wear of opposing enamel or restorative materials. I find that I can achieve a well-polished, high-lustre restoration by using the Enhance system incorporating Prisma Gloss polish.

There are many composite materials on the market and it can be difficult to decide on which product to use. I don’t believe that there are major differences in performance between many of the well-known brands, and that the technique and skill level used to place these types of restoration is probably more important than the material itself.

References

According to the Mouth Cancer Foundation, cancer can occur in any part of the mouth, tongue, lips, throat, salivary glands, pharynx, larynx, sinuses, and other sites located in the head and neck area. These mouth cancers have a higher proportion of deaths per number of cases than breast cancer, cervical cancer or skin melanoma.

The treatment of cancers of head, neck and mouth can create a range of difficulties in oral hygiene care. Maintaining as healthy a dentition as possible during and post-surgical, radio and chemotherapy treatment can be challenging for the dentist and the patient.

Oral cancer itself is relatively rare comprising just 1.7 per cent of all cancers diagnosed in the UK each year. There is no substitute for early detection and prevention by the whole dental-health team and part of this is identifying at risk groups by focusing on at risk factors including age, gender, smoking and alcohol use, diet, exposure to sunlight. HPV (Human Papillomavirus), oral cleanliness, and prior history are also beneficial; however definitive causes of oral cancer have yet to be identified.

Before treatment begins

Ideally, before a patient commences cancer treatment, time permitting, the mouth needs to be at optimal possible health: restorative and hygiene treatments should be completed and an exemplary oral hygiene routine instigated. This reduces the frequency and duration of complications of oral cancer treatment.

This hygiene routine should encompass a three-step process of:

1. Mechanical plaque removal with a soft toothbrush. Where there is soreness and irritation present and brushing causes discomfort an ultra soft brush should be used. Brushing in conjunction with a dentifrice such as GUM Paroex Dentifrice Gel optimizes plaque removal and promotes healthier gums. This gel contains Vitamin E an antioxidant, D-Panthenol a pro-vitamin B5, and chlorhexidine 0.12 per cent an oral antiseptic agent.

2. Interdental cleaning using soft floss or soft toothpicks to reduce the plaque between the teeth and below the gum line. Alternatively, for those who find floss awkward to use, soft toothpicks are a good alternative, finely tapered for small spaces.

3. For optimal health, these two steps should be followed by the use of a mouth rinse, either saline (salt water) or a preferred proprietary brand.

Where there is the presence of inflammation such as gingivitis and periodontitis the use of a chlorhexidine digluconate mouthwash is indicated prior to treatment. It is recommended that the use of mouth rinses containing chlorhexidine digluconate are used for a limited period of time as they can cause unwanted side effects such as dry mouth and loss of taste. These are side effects that are often already present during and after cancer therapy and prolonged use of a chlorhexidine digluconate mouthwash will only exacerbate these problems.

Benefit of probiotics

In conjunction with these three steps I would strongly rec-