Posterior Composites in General Practice

Trevor Bigg gives an overview of restorative composites

Fig 1. Right Bitewing

The greatest change that has occurred in the day-to-day running of a general practice has been the increasing use of composite filling materials in the restoration of posterior teeth.

Amalgam or Composite?
Dental amalgam has been the material of choice for restoring posterior teeth during the past 160 years. Despite repeated attempts to prove the dangers to the patient of using this material no significant link has been shown and, on July 28, 2009 the US Food and Drug Administration stated that unless the patient is allergic to mercury “the levels (of mercury) released by dental amalgam and batteries, as next to chlor-alkali production for batteries (to be phased out by 2020), dental amalgam will be the largest mercury use in the EU.”

In June this year, a joint DoH and DEFRA meeting issued a statement that the UK’s current use of amalgam fills no longer be used in already heavily restored dentitions in older patients. 4

The exemptions, which would be reviewed after five years to identify if they were still required, would allow amalgam to be used under the following conditions:

1. Poor moisture control
2. Difficult cavity accessibility
3. Large cavities
4. Large interdental spaces to be bridged.

It is at this point that some readers may be thinking that the banning of amalgam is long overdue, but it must not be forgotten that amalgam, for all its faults, is a very forgiving material and even the EU is aware that there are situations indicating that over one-third of an American’s mercury exposure is from dental amalgam. Even though there are many other sources of mercury in the environment, the continued action from pressure groups in Europe led to the European Union (EU) commissioning the BIO Intelligence Service (BIOS) to review the potential for reducing mercury pollution from dental amalgam and batteries, as next to chlor-alkali production for batteries.

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Matrix techniques: On the advice of the Chief Dental Officer, all dentists should be using single-use, disposable matrix bands, as it is impossible to clean assembled conventional bands such as Sigveland adequately. 9, 10

The use of disposable products such as Omni-Matrix (Ultradent) and AutoMatrix (Dentsply) provide affordable, well-fitting matrix bands that act as a mini-dam in keeping oral fluids out of the prepared cavity. The band must be shaped so that the correct contact area is produced on the proximally tooth to reduce the risk of food packing and drifting. A sectional matrix, such as Palodent (Dentsply) is excellent at producing a good contact, but care should be taken in older patients as the wide contact area produced by wear over time is not reproduced by most sectional systems.

Bulk fillers: Returning to the original scenario, already 5-10 minutes of the half-hour appointment has been used. To enable the rapid placement of a composite restoration a new generation of flowable composites has been developed to use as a liner or bulk filler, such as SDR (Dentsply) and Venus Bulk Fill (Herbst) or bulk filler, such as SDR (Dentsply) is excellent at producing a good contact, but care should be taken in older patients as the wide contact area produced by wear over time is not reproduced by most sectional systems.

Bleaching and Posterior Composite

1. Place a 0.5 mm liner at first, as the base of a thicker layer may be further than the maximum depth of 4 mms when a matrix band has been fitted or a deep cavity is present. The initial thin layer is self-leveling as it flows into the irregularities of the cavity floor and may increase marginal adaptation in the gingival margin area. It also acts to stabilize the matrix band, preventing slippage if little tooth is left supra-gingivally. (Fig. 7)

2. Place a further layer of liner, or bulk fill if the cavity is deep, allowing a minimum of 2 mms of conventional composite occlusally to improve wear resistance and appearance. Adaptation of the second layer of flowable or conventional composite is enhanced by the smooth surface left by the initial lining technique.

Finishing techniques: Good finishing techniques reduce the failure rate caused by secondary caries in composite restorations:

- Trim using a copious quantity of water as coolant, as overheating the composite encourages rapid shrinkage causing failing margins in time
- Try not to use ‘course’ diamonds, as they can cause deep surface scratches and loss of filler particles
- Direct the bur from the tooth to the filling to reduce iatrogenic damage
- Remove ‘high-spots’ and contacts on the tooth-restoration junction
- Do not ‘over-carve’ the surface, as deep fissures can make cleaning more difficult in some cases and could predispose towards fracture
- Etch and wash the finished restoration and use the remaining bonding agent to re-seal the margins and repair surface micro-cracks (Fig. 8)

Conclusion

Posterior composite restorations are ‘technique sensitive’ and do require training and experience if a good restoration is to be placed in the limited time available in general practice.

Materials research is slowly improving the outcome of these restorations and part of a dentist’s Continuing Professional Development should be in engaging in these advances so that a long lasting, functional and aesthetically pleasing restoration can be provided in a realistic time-scale, to the benefit of the dental health of our patients and the financial health of our practices.

References:

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