A practical guide to posterior composites

LOUIS MACKENZIE presents a case report on posterior composites – easy MODs...

The Probe | February 13 dentalrepublic.co.uk

WORLDWIDE, the replacement of existing restorations accounts for over 50% of every general dental practitioner’s average daily workload. As a result, the successful introduction of new materials, equipment and techniques has huge potential to improve the quality of patient care and increase the enjoyment of carrying out restorative procedures. The following case presentation describes the clinical and management of a pregnant patient who presented with a painful lower right first molar, and focuses on technologies aimed at optimising the procedure.

Isolation
While use of rubber dam is far from commonplace, it is generally considered to be the ideal method of moisture control. In this example, as well as optimising the adhesive procedure, rubber dam isolation (figure 1) facilitated with accurate protection of secondary and primary (distal/occlusal) carious lesions and protected the pregnant patient’s airway from amalgam debris during restoration removal.

Cavity preparation
The aim of contemporary minimally invasive dentistry is to preserve the maximum amount of tooth tissue. Therefore, caries excavation was limited to allow the visualisation and excavation of irreversible demineralised dentine and the removal of fragile enamel only (figure 2). The adhesive nature of the direct composite procedure chosen in this example further minimised cavity preparation by obviating the need for removal of unsupported enamel and incorporation of additional retention/ resistance preparation features. If an indirect option had been selected, the undercutting ensuing from caries excavation would have required removal (or blocking out), resulting in further unnecessary sacrifice of tooth tissue in an already weakened tooth.

Sectional matrices
A common and annoying mode of immediate failure for posterior composites is the accidental formation of open contact points, promoting uncomfortable food packing and increased risk of recurrent caries and/or periodontitis. The potential for inadequate contacts is increased when restoring both mesial and distal surfaces, as in this example. The prevalence of poor contacts may often be attributed to the use of inappropriate matrix systems, designed long ago for use with visually detection of secondary and periodontal defects. Research at multiple centres worldwide has demonstrated that the use of specialised sectional matrix systems, consistently delivers restorations with tighter contacts and more natural proximal contours.

Sectional matrices (figure 3) are extremely thin; possess convex contour; and are easily diminished against adjacent teeth. Various shapes and sizes are available and matrix selection should be based primarily on the height that allows orientation with the:

- Cervical edge below the cavity margin.
- Cervical edge just higher than adjacent marginal ridge(s).

Optimising matrix selection minimises excess and results in more anatomical, clearance contacts that are not-positioned too near marginal ridges.

Sectional matrices may be positioned with fingers or tweezers, but the use of bespoke instruments simplifies placement and, more importantly, removal. In this example, operator preference was to apply a thin, localised lining of resin-modified glass-ionomer to provide a long lasting seal over the deepest pulpal dentine. Such a procedure is termed indirect pulp-capping.

As caries excavation routinely results in undermining of teeth with inadequate retention and resistance form, less technique sensitive, time saving, self-etching adhesives may be used, such as the highly respected Clearfil Majesty Esthetic (Kuraray, Japan), which provides a predictable bond and cavity seal that enhances the demise of the residual bacteria that are always left within caries affected dentine.

Wedges
Wedging is essential to deliver a cervical seal that reduces the risk of restorative material extrusion. Set cervical excess will create plaque retention factors that may be difficult to remove without atomic damage to adjacent tissues. Wedges also separate the teeth, compensating for matrix thickness, and therefore improving contact tightness.

Plastic wedges, such as Flexi-wedges (Common Sense Dental Products Inc, Springlake, MI, USA) (figure 3), are easy to force into – and remove from – tight contacts, and have concave gingival surfaces that allow them to be placed over interdental papillae. This reduces the risk of matrix deformation that may result in restorations with unnatural proximal emergence profiles.

Separation rings
Along with sectional matrices and wedges, the third and final matrix system component comprised flexible separation rings, which were applied to buccal and lingual embrasures using specialised forceps, similar to rubber dam forceps. As their name implies, they helped augment the tooth separation initiated by wedging and improved lateral matrix adaptation. This significantly reduced the amount of lateral excess which, once set, can be challenging and time consuming to remove with accuracy.

In this respect, the revolutionary soft rubber faces of the award winning Composi-Tight 3D system (Garrison Dental Solutions, Springlake, MI, USA) (figure 4), automatically provided exceptional control of restorative material.

While this type of system is usually described for use with single proximal boxes, they may also be employed to simplify MOD restorations, as in this example. Composi-Tight 3D separation rings are orientated with the bow facing mesially, and have been designed to allow the distal ring to be placed over the mesial ring, as illustrated.

Materials
Use of a sectional matrix system conveyed immediate operator benefit by making incremental composite placement very easy and significantly reduced the amount of adjustment required after light-curing.

In this example, the hybrid material chosen was Clearfil Majesty Esthetic (Kuraray, Japan), based upon its superior handling properties (highly sculptable/non-sticky) and its outstanding aesthetic properties. Note: When using this material for posterior restorations, shade A2 routinely delivers pleasing restorations for both patient and operator, without the need for more time-consuming layering or fissure-staining techniques. Also, the use of a lighter shade allowed greater depth of light-penetration during polymerisation.

Specially designed instruments may be used to simplify placement and shaping, such as the LM-arte instruments (LM-Instruments, Finland) developed in collaboration with Style Italiano, a group of Italian experts specialising in cosmetic dentistry. Of the range of five composite instruments in the Tipsura instrument is particularly helpful in shaping the fissure and fossa anatomy of posterior composite restorations. Figure 5 shows the attractive appearance of Clearfil Majesty Esthetic at 2.5 years post-operatively, and demonstrates the natural proximal contours delivered by the sectional matrix system that facilitate oral hygiene measures to maximise restoration longevity.

Summary
Contemporary dentistry offers a wide, and sometimes bewildering, range of posterior composite products. The time taken to discover favourite equipment and materials and to practise and refine techniques will be rewarded on a daily basis with efficient, predictable, enjoyable, aesthetic restorative dentistry.

About the author
Louis Mackenzie, GDP and clinical lecturer at University of Birmingham School of Dentistry.

References

Acknowledgements
The author would like to thank David Mason and Julie Evans of J+S Davis Ltd for their support in the conception of this case report.

Reader enquiry: 104

Materials
Use of a sectional matrix system conveyed immediate operator benefit by making incremental composite placement very easy and significantly reduced the amount of adjustment required after light-curing.

In this example, the hybrid material chosen was Clearfil Majesty Esthetic (Kuraray, Japan), based upon its superior handling properties (highly sculptable/non-sticky) and its outstanding aesthetic properties. Note: When using this material for posterior restorations, shade A2 routinely delivers pleasing restorations for both patient and operator, without the need for more time-consuming layering or fissure-staining techniques. Also, the use of a lighter shade allowed greater depth of light-penetration during polymerisation.

Specially designed instruments may be used to simplify placement and shaping, such as the LM-arte instruments (LM-Instruments, Finland) developed in collaboration with Style Italiano, a group of Italian experts specialising in cosmetic dentistry. Of the range of five composite instruments in the Tipsura instrument is particularly helpful in shaping the fissure and fossa anatomy of posterior composite restorations.

Figure 5 shows the attractive appearance of Clearfil Majesty Esthetic at 2.5 years post-operatively, and demonstrates the natural proximal contours delivered by the sectional matrix system that facilitate oral hygiene measures to maximise restoration longevity.

Acknowledgements
The author would like to thank David Mason and Julie Evans of J+S Davis Ltd for their support in the conception of this case report.

About the author
Louis Mackenzie, GDP and clinical lecturer at University of Birmingham School of Dentistry.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5