Adhesive dentistry

Over the past few years patient demand for better aesthetics has been met with an amazing spectrum of new materials and techniques.

Nowhere has the revolution in dental materials been more apparent than in the field of adhesive dentistry. The attraction of minimal tooth preparation, coupled with highly aesthetic restorative materials is appealing to patient and dentist alike. However, there is often a price to be paid for these benefits, and one which may not be obvious to the patient unless the dentist takes the time to explain all the advantages and disadvantages of the various options.

Problems frequently arise in adhesive dentistry when the dentist has heavily emphasised the benefits of these materials and techniques without warning the patient of the limitations.

Composite restorations

Patients are demanding tooth-coloured fillings either for aesthetic reasons or because of their own concerns about mercury toxicity in amalgam restorations. In the first instance, there is no doubt that composites provide a more aesthetic solution than amalgams. However, where a patient is requesting the removal of amalgams to cure a medical problem e.g. multiple sclerosis or allergies, the dentist must be wary of representing the proposed composite restorations as a cure, since the evidence to substantiate these claims, is, at best, inconclusive.

The decision to restore a tooth with a composite restoration will be dependent on a number of factors, including:

- Patient preference
- Size and shape of the cavity
- Occlusion
- Ability to isolate the tooth to keep it moisture free
- Cost and time

The choice of a composite restoration by a patient should be on an informed basis and some of the problems previously encountered by dentists can serve to highlight areas that should be discussed with patients, Perhaps with the help of a simple information leaflet.

Common problems with composite

Postoperative sensitivity

Amalgam is generally a well-tolerated material and is less prone to cause postoperative sensitivity than directly placed composite fillings. Sensitivity can be caused by a variety of factors and a study of the literature will show a number of techniques that attempt to overcome the problem.

The risk of postoperative sensitivity is difficult to eliminate however. So it makes sense to warn a patient of the possibility, even if only to reassure them of its transitory nature. The patient should be advised to return if the sensitivity fails to resolve, and this should be recorded in the clinical notes.

Wear characteristics

Many composites have a wear characteristic that is poorer than amalgam especially in load-bearing areas. Where larger restorations are placed or when patients have a bruxing habit, particular care should be taken. In these cases consideration should be given to the use of alternative materials or even a fixed restoration – particularly when replacing more than one cusp on either premolar or molar teeth.

Discoloration

Unlike porcelain, most composites absorb stains and this can very quickly compromise the aesthetics of an otherwise
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Successful result. Patients should be warned of the potential for tobacco, red wine, coffee or tea to stain their new composite fillings. Other food substances (e.g. turmeric in Asian foods) can also stain the restorations, as can mouthwashes containing chlorhexidine. When planning anterior composite restorations, it is important that these factors are considered and the patient warned accordingly so that they can make informed choices about their dental care.

Debonding
To a patient, a filling is often considered to be a permanent solution. Where there is little tooth substance, heavy occlusal forces, or parafunctional activity/habits, a patient should be advised that their composites might fail. Incisal edges and corners of anterior teeth are often restored in composite and these can sometimes be problematic when the dentist is adopting a minimally invasive technique and relying on maximal retention from the adhesive bond and etch technique. The risk should be explained to the patient before placing the restoration because an informed patient is more likely to understand and accept an adverse outcome.

The above list of potential problems seems prohibitive but there is no doubt that composites are here to stay, are very effective when used appropriately, and are often an excellent aesthetic alternative to other more radical and invasive treatment options.

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Veneers are often used to close or reduce midline diastemas while preserving as much tooth tissue as possible - but the patient must understand the limitations and likely aesthetic outcome before proceeding.

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Common problems with adhesive bridges
Adhesive bridges or resin-bonded bridges have come a long way from the first Rochette bridge. The considerable advances in adhesive technology enabling metal to be bonded to teeth have made this technique a more realistic alternative to dentures or implants. Unfortunately they can also be unpredictable despite the research evidence on the longevity of the bond.

There are several factors to consider when planning treatment for a patient with a view to providing adhesive bridgework.

Location
The upper anterior part of the mouth is the most popular site for
the placement of these bridges and often the most successful. Posterior bridges have a poorer long-term success.

Occlusion
When planning for the bridges ensure that there is a favourable occlusion both in static and dynamic relationships. This is best examined with the help of articulated study models.

To prepare or not prepare?
The decision to prepare teeth with a guide plane, rest seats or pins or to leave it unprepared is a clinical one and will reflect the clinician’s experience and training. It is essential to discuss the relative merits of both approaches with the patient. If the tooth is prepared in any way, it no longer becomes a ‘reversible’ option even if it is minimally prepared. It is important to establish this with the patient because if the bridge fails, the patient is automatically committed to remedial treatment of the prepared tooth or teeth. The patient should be aware of this before giving their consent to the procedure.

One wing or two?
When replacing a single anterior tooth research now seems to indicate that a single wing is the treatment of choice and a cantilever design should be planned. Sometimes there is differential movement of the teeth in occlusion so when two wings are used there is a distinct risk of one of them detaching. If this goes unnoticed, caries could develop behind the loosened wing. Clearly this is something that needs to be discussed with the patient and whichever design is chosen, the patient should be aware of the implications for its maintenance and the need for regular attendance to check it.

Common problems with veneers and dentine bonded crowns
These adhesive restorations have transformed millions of smiles around the globe and continue to do so successfully. However, they need careful planning and to be aesthetically successful, some tooth substance usually needs to be removed. Again they cannot be viewed as being a ‘reversible’ option since their failure will always necessitate further treatment even if only to replace the porcelain veneers with composite facing. There is a danger that veneers will be promoted to patients as an ideal alternative to crowns, and a quicker and cheaper route to a film star smile. It is easy to see how patients might view veneers as a win/win option, so it is vital that any dentist contemplating providing veneers or dentine bonded

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Tech Specs

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crowns for a patient should discuss their particular needs very carefully. Pre-operative photographs and study models are helpful in communicating with the patient, but they also form a vital part of the patient record. In addition a meticulous note of all the relevant conversations held with the patient should be entered in the record.

Case study
A young male patient in his early twenties requested a dentist to close his midline diastema. He was getting married the following month and wanted this done before the wedding day. It was quite a large gap of some 4mm between the upper central incisors but the dentist confidently assured the young man that he could close the gap and produce ‘a perfect smile’ ready for the wedding photos.

At the next visit the patient returned, asking the dentist to prepare the two lateral incisors as well as the centrals. This was duly done and an impression was taken before the patient re-booked to return in two weeks time.

At the fit appointment the two central veneers were tried in and the patient agreed they looked fine. However the dentist had not shown him all four veneers in place and had not tried them in using the try-in paste that came with the bonding kit.

The dentist went ahead anyway and cemented them in. When he looked in the mirror, the patient was surprised at the result and not at all happy with the size of the central incisors. He also felt the veneers were quite bulky under his lip. The dentist reassured him and asked him to return in a couple of weeks. The patient phoned the next day having shown the veneers to his fiancée. Both were very upset with the result as they felt the front teeth were far too prominent and dominated his smile too much. With the wedding taking place in less than a fortnight the dentist agreed to replace them at his own cost. The patient had lost confidence in the dentist by now and instead went to another dentist who replaced the veneers for a considerably higher fee.

Conclusion
The size of the diastema was quite large and to mimic the final effect of the veneers, composite applied to the teeth without etching would have given the patient and the dentist a quick and reversible guide as to the final result.

Diagnostic wax-ups in advance of treatment might also have allowed both patient and dentist to anticipate the likely size and shape of the finished veneers.

The patient should have been warned that the veneers would feel slightly bulky under their lip and that the sensation would soon pass.

The patient should have been warned about the possible changes in speech and the potential to lisp in the early days after the veneers were placed.

Many veneer kits come with a try-in paste and where appropriate this could be used to establish how the final result would look, before finally cementing them.

The entire problem could have been prevented by more careful planning and better communication with the patient before the treatment started, about what to expect.