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The occlusal matrix

One of the most difficult and time consuming aspects of placing a large direct restoration is contouring the occlusal surface.

Many large restorations are left with a flat plane that is of little use in the mastication of food. Large flat surfaces also create areas on the occlusal table subject to high point loads, especially near marginal ridges that will lead to fracture and failure of the restoration.

This article continues with the concept in Aesthetic Update, 'The plum pudding restoration' (News Bulletin, March 1998). It can be accessed on the web at www.dentalk.com.au

The use of an occlusal matrix identifies the position of the main central groove on the occlusal surface, enabling a clinician to develop this and other supplementary grooves over the occlusal table.

Furthermore, cusp overlays can be contoured by using a slightly blunt 12 fluted tapered Tungsten Carbide bur to remove excess composite on the facial or lingual aspects of the tooth without damaging the adjacent enamel surfaces. This makes it possible to create cusp overlays using composite resin without exposing enamel on the occlusal surface.

The clinical procedure has been in use for over four years and many large cusp overlay direct resin restorations have been placed during this time. In each case, the co-cure technique was used to create a layered GIC/resin restoration, replacing dentine with GIC and enamel with composite resin.



Fig. 1. The occlusal surface of a three-quarter coronal restoration after 3 years. Note the minimal wear on the occlusal surface.



Fig. 2. The facial aspect of a direct three-quarter coronal restoration placed 3 years previously. The buccal surface was made using a microfill resin and has maintained a high polish and good aesthetics over this period.



Fig. 3. A full direct coronal restoration on a lower molar after 2.5 years. The occlusal surface was developed with the aid of an occlusal matrix.

three years previously. The buccal surface was made using a microfill resin and has maintained a high polish and good aesthetics over this period.

Figure 3 shows a full direct coronal restoration on a lower molar after 2.5 years. The occlusal surface was developed with the aid of an occlusal matrix.

The clinical case shows a mirror view of tooth 47 where a full coronal co-cured restoration has been placed (Fig. 4). All occlusal interferences have been removed over the full range of mandibular movement. Contaminants have been cleaned from the surface by



Fig. 4. A mirror view of tooth 47 where a full coronal co-cured restoration has been placed. All occlusal interferences have been removed over the full range of mandibular movement.

www.dentalk.com.au (News Bulletin, May 1997).

Figures 1 and 2 show the facial and occlusal aspects of a direct three-quarter coronal restoration placed



Fig. 5. A 3cm square piece of freezer bag is placed over the tooth and dental floss passed through the mesial and distal contact areas and tied around the tooth to contain the still malleable composite resin.

copious washing with water and drying with oil-free air.

Unfilled resin was brushed over the occlusal surface and an increment of 'packable' hybrid composite resin placed on the occlusal surface, judged sufficient to make a full impression of the antagonist teeth without too much flash being produced bucco lingually.

A 3cm square piece of freezer bag was placed over the tooth and dental floss passed through the mesial and distal contact areas and tied around the tooth to contain the still malleable composite resin (Fig. 5). Analogous to a plum pudding.

The patient was asked to place the tongue at the back of the hard palate to take the mandible to a retruded position and slowly bite together, moving the mandible forwards and sideways with the teeth remaining in contact.

The patient was next asked to open to confirm the shape of the occlusal surface and that sufficient composite was present to form the occlusal table.

After closing again in a retruded position, the area was spot cured from the buccal for five seconds.

Finally, the patient was asked to open their mouth, the occlusal surface was cured for a further five seconds, after which the freezer bag was removed, and a further 10 seconds curing applied (Fig. 6).

Figure 7 demonstrates how a functional occlusal surface can be created.



Fig. 6. The light-cured restoration with the occlusal matrix still in place.



Fig. 7. A functional occlusal surface can be created. By examining the inclined planes, the position of the central groove is observed slightly to the lingual on the occlusal surface and the positions of the occluso-buccal and occluso-lingual grooves are also identifiable.

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Occlusal anatomy was created using high and low speed burs:

- Excess composite flash on the buccal and lingual surfaces was removed using a slightly blunt 12 fluted Tungsten Carbide bur.
- The same bur was used to make the initial cuts to locate the position of the bucco, lingual and occlusal grooves.
- Once the grooves were outlined, inclined planes and supplementary grooves were developed either with the same TC bur or a slow speed pointed diamond bur.
- A small, coarse Soflex disc was used to spheroid over the margins



Fig. 8. The full coronal restoration with a functional anatomical surface.



Fig. 9. The same tooth taken from an oblique angle to demonstrate the cusp overlays on the buccal aspect and the position of the inclined planes. Note the faint demarcation line between the GIC and composite resin on the mesial aspect of the restoration.

and to soften the occlusal anatomy created by the burs.

- A final polish with a rubber wheel or finer disc completed the restoration.

Figure 8 shows a full coronal restoration with a functional anatomical surface.

Figure 9 shows the same tooth taken from an oblique angle to demonstrate the cusp overlays on the buccal aspect and the position of the inclined planes. Note the faint demarcation line between the GIC and composite resin on the mesial aspect of the restoration.

Such coronal restorations provide patients with a predictable, aesthetic, low biological and low fiscal cost outcome. The use of an occlusal matrix significantly reduces the clinical time required to place the restoration and by increasing the range of services offered, practitioners can expect increased referrals to the practice from satisfied patients. □