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First contact

Dr Richard Field describes a technique for predictable contact point management

Figure 1: The UR5 had a very flat distal surface with an open contact point

Figure 2: The UL quadrant was anaesthetised with a buccal infiltration and isolated with non-latex rubber dam

Figure 3: The existing composite restoration was carefully removed and the extent of the caries observed

Figure 4: The margins were finished with a red-banded inlay bur in an air turbine

Figure 5: The sectional matrix ring was then used to push the teeth apart and to give the matrix the correct contour

Figure 6: The first increment of composite (Venus Pearl B1) was placed and polymerised for 10 seconds

Figure 7: The matrix system and wedge were removed causing the teeth to come back into tight contact

Figure 8: The first increment of Venus Pearl OMC was placed on the palatal cusp from the level of the ADJ to the centre of the cavity floor and polymerised

Figure 9: This method helps to create a natural internal anatomy and starts to define the fissure pattern from the inside

One of the most frustrating aspects of dentistry is removing the matrix band from around a beautiful composite you have spent ages contouring, only to find there is a gaping open contact. Disaster!

Not only is an open contact a problem aesthetically, but it can cause a host of problems for the patient. These include food packing and, ultimately, secondary caries, if the area is difficult to clean.

The following case study demonstrates a step-by-step technique to create predictable, tight contact points.

Treatment planning

A 27-year-old female patient in good general health, with an unremarkable medical history, presented complaining of food packing between the UL5 and UL6.

Clinical examination showed the patient had good oral hygiene and mildly restored, well-maintained dentition. In the UL quadrant, both the UL5 and UL6 were restored with distal-occlusal (DO) and mesial-occlusal (MO) restorations respectively. The UR5 had a very flat distal surface with an open contact point (Figure 1). A bitewing radiograph was taken showing secondary caries under the DO restoration in the UR5.

Following discussion of the options with the patient, she agreed that the best course of treatment was to replace the restoration in the UL5 with a new composite restoration, making sure a tight contact was achieved with the UL6. Although the restoration in the UL6 was not of ideal morphology, it was clinically sound, so the decision was made to leave it under observation.

I made the decision to use Venus Pearl for this case, as I find it very easy to handle at room temperature and it does not stick to instruments. The opaque dentine shades lend themselves very well to the bi-layered stratification approach detailed below.

Preparation

The UL quadrant was anaesthetised with a buccal infiltration (4% Articaine hydrochloride1:100000 epinephrine) and isolated with non-latex rubber dam (Unodent) (Figure 2). The existing composite restoration was carefully removed and the extent of the caries observed (Figure 3). The cavity was carefully prepared with tungsten carbide rose-head burs in a slow speed handpiece. The margins were finished with a red-banded inlay bur in an air turbine (Figure 4).

Technique

It is at this point that how best to restore the contact area must be considered. To achieve a tight contact point, the opposing tooth must be pushed away during the construction of the interproximal wall. When the pressure is released the teeth come into tight contact. This is achieved with the use of a sectional matrix system. In this case the Composi-Tight 3D system from Garrison Dental was used, but there are others available.

An anatomically contoured, clear sectional matrix strip of the appropriate size was selected and placed between the two teeth. A wedge was then employed to secure the strip against the teeth. My preference is for the Triodent wave wedge, as its hollow design is kinder to the interdental papilla. The sectional matrix ring was then used to push the teeth apart and to give the matrix the correct contour (Figure 5).

Once the whole matrix system was in place and had been checked for tight contact at the cavity margins, the preparation was etched using the total etch technique with 37% phosphoric acid. A two-stage bonding agent was used with two coats of primer and one coat of adhesive, followed by thorough polymerisation.

Composite build-up

A small amount of flowable composite (Heraeus Kulzer Venus Flow) was placed in the deepest part of the cavity, taking care not to cover any of the enamel margins. This was polymerised for 20 seconds.

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Figure 10: To replicate the warmth of the natural fissures a 50/50 mix of Venus Color Amber and Corn tints was placed into the fissure created

Figure 11: The increments of enamel shade were stopped just short of the fissure, so not to overlay the tints

Figure 12: A very small increment of a highly translucent enamel shade (Venus Pearl CL) was used to replicate the marginal ridge, and polymerised for 10 seconds

Figure 13: A final cure was carried out under glycerin for 40 seconds

Figure 14: Immediate post-operative results

Figure 15: Two-week review

The first increment of composite (Venus Pearl B1) was placed extending from the disto-palatal cusp, along the enamel margins in contact with the matrix strip to the centre point of the interproximal margin. This was then polymerised for 10 seconds (Figure 6). It was not extended across the entire interproximal surface to lower the contraction stresses on the enamel.

The second increment of composite extended from the disto-buccal cusp to come into contact with the previous increment. Following polymerisation for a further 10 seconds, the matrix system and wedge were removed causing the teeth to come back into tight contact (Figure 7). Another benefit of creating this custom shell is that it turns a relatively difficult, two-surface cavity into an easily restored occlusal cavity.

Creating natural internal anatomy

A high chroma, opaque composite (Venus Pearl OMC) was chosen to match the tooth's natural dentine. The first increment was placed on the palatal cusp from the level of the amelodentinal junction (ADJ) to the centre of the cavity floor and polymerised (Figure 8). The second increment of the dentine shade was placed in the same fashion on the opposite cusp. This method helps to create a natural internal anatomy and starts to define the fissure pattern from the inside (Figure 9).

To replicate the warmth of the natural fissures a 50/50 mix of Venus Color Amber and Corn tints was placed into the fissure created by the dentine increments, using a size 8 endodontic file. This was then polymerised for 20 seconds (Figure 10).

To best imitate the natural enamel layer a high value composite (Venus Pearl BL) was placed initially in small increments in the centre of the cuspal inclines. It was adapted over the enamel margins with a micro-brush, lightly coated in an unfilled wetting resin and then polymerised for 10 seconds. The increments of enamel shade were stopped just short of the fissure, so not to overlay the tints (Figure 11).

The remainder of the enamel (Venus Pearl B1) was then placed on either side of the high value enamel shade, again stopping just short of the fissure, and brushed over the enamel margin. A very small increment of a highly translucent enamel shade (Venus Pearl CL) was used to replicate the marginal ridge, and polymerised for 10 seconds (Figure 12).

A final cure was carried out under glycerin for 40 seconds, to ensure complete polymerisation of the composite and removal of the air inhibited layer, before finishing (Figure 13).

Finishing

Gross excess and flash were removed using a disposable No.12 scalpel (Swann-Morton) and rounding of the interproximal angles was carried out with a finishing disc at slow speed. The surface of the restoration was polished with silicon points. A final high polish was achieved with silicon impregnated brushes using light pressure at a very slow speed. The occlusion was then checked and the immediate post-operative results can be seen in Figure 14.

Outcome

On reflection, a better contact point could have been achieved by replacing the restoration in the UL6 at the same time, using the same technique. As the restoration in the UL6 was sound, and a good contact would be achieved by replacing the UL5 alone, it was not deemed clinically necessary.

The patient was very happy with the outcome, as she no longer has a problem with food becoming trapped between her teeth. By using the approach detailed above, it is possible to create aesthetic restorations with consistent, tight contact points (Figure 15). The sectional matrix systems can be fiddly at first but, with practice, they will become part of your daily armamentarium.