

Different indications for a flowable material

Introduction:

Nowadays, flowable composites nowadays occupy a more and more important place in adhesive dentistry. These flowable composites can be used alone or together with other materials, as in the case presented here.

We will here show the use X-flow™ in 3 different situations:

- In a premolar, into a distal cavity without opening the marginal crest.
- In the second molar, as a direct placement into a small cavity with a very small opening without risking the inclusion of air bubbles
- Finally, in the first molar, as a liner at the bottom of the cavity under Quixfil™, Posterior Restorative .

Dentsply materials shown in this film:

- X-flow™, Universal Flowable Restorative
- Quixfil™, Posterior restorative
- Xeno®III Single Step Self etching Adhesive
- Palodent® Sectional Matrix System
- PoGo™ One Step Diamond Micro-Polisher

Original Clinical Situation

This posterior upper jaw section comprises of a first molar amalgam filling with a recurrence of a very large carious lesion that is suspected to be under the mesial-buccal cusp, and a distal proximal carious lesion on the adjacent premolar that was discovered on the x-ray.

On this X-ray we can see the overfilled molar amalgam filling with undercuts, the distal carious lesion on the premolar, and the small amalgam filling on the second maxillary molar.

Cavity preparation:

1 Floss and removal of old fillings

We use dental floss to check the point of contact between teeth 5 and 6, which enables us to confirm the presence of undercuts on the filling that would tear the rubber-dam when we try to put it in place.

We start by removing the sole proximal portion of the filling, to enable us to insert the rubber-dam more easily. Using a probe, we can see the carious lesion on the distal proximal surface of the premolar.

The rubber dam fits easily now and we start to remove the rest of the amalgam filling. The removal is always performed using a water spray as you can see. A large mass of secondary caries is discovered under this filling.

2 Cavity cleaning

We also have the distal carious lesion that we have to clean out and we can see on the screen here that, at the cervical margin, the enamel bridge has become too fragile. We are, therefore, obliged to remove this enamel bridge to form a mesial-occlusal distal cavity.

The carious lesion is cleaned classically, using a ball bur mounted on a blue ring contra-angle handpiece, working with care so as not to make the mesio-vestibular cusp more fragile than it already is.

Here, you can see the very large cavity after our preparation.

The amalgam is now removed from the second molar tooth, using the least traumatic method possible, since no caries have been detected in this tooth. This cavity does not require a lot of cleaning, despite a very small carious lesion at the bottom. The distal carious lesion of tooth number 5 is easily accessible with a ball bur thanks to the opening created at tooth 6. We can now see the cavity cleaned but we have preserved the proximal crest and wall.

Placement of Xeno[®]III, Single Step Self Etching Adhesive

We use a self-etching adhesive system – Xeno[®]III, which has two advantages:

- The first is that it is applied in one step, after mixing a drop from each bottle.
- The second is that the solvent is made up of water and alcohol. This means that slightly hydrated or even dehydrated dentine will not affect the application of the adhesive.

The applicator tip enables us to impregnate the dentine layer and, here, you can see we have placed a metal matrix to avoid spilling it over to the contiguous tooth.

Since tooth 5 presents a distal carious lesion, we have not placed any matrix band there.

We must make sure that the adhesive is applied on all the cavity walls, and on both dentine and enamel. Tooth Number 7 is now treated and the 3 cavities are treated with the adhesive in the same session. After slight evaporation of the solvent, the adhesive system is light-cured with a Degulux[®] lamp for 10 seconds for each cavity.

Placement of X-flow™ for direct filling

X-flow™, the Universal Flowable Restorative, is applied directly from a Compula Tip into the distal cavity of the premolar. It is very easy to work with and to control where it has to be positioned: It did not flow towards the cervical margin and we can even make it a little convex, thus reproducing the surface. You can see here that we even have used slightly too much material and we will deal with this now.

To compensate for the excess material applied, we use a metal abrasive strip rolled around tweezers on one side and kept in place with the finger on the other side. This enables us to place it perfectly into the interproximal space. It is now easy to reshape the convexity of the distal surface. Naturally, we take care not to tear the rubber-dam since these strips are very sharp.

The result: we obtained an ideal convexity on the distal surface of tooth 5 on the upper jaw.

At tooth 7, the X-flow™ flowable composite is also applied directly out of the compula: this is greatly facilitated by its thin cannula, especially in such a posterior area that is usually difficult to access.

Placement of Palodent® Sectional Matrix system

We now place the Palodent® Matrix to reconstitute Tooth 6. The matrices will be inserted distally and mesially using tweezers. These matrices are very fine to facilitate the reproduction of the contact point. You can see the matrix being fitted to the distal cervical wall. The curved form facilitates the anatomical reconstruction.

We insert a wooden wedge to ensure a perfect fit – this wedge being forced into the interproximal space. The Palodent matrix band is also inserted mesially as you can see followed by the wooden wedge. We finish by placing the round spring ring. However, as it is a large mesial distal occlusal cavity, a first ring is inserted mesially, and a second oval ring placed distally ensuring a good view of the clinical field.

Here, the entire matrix system is now in place, and you can see, it gives us totally satisfactory access to the cavity.

Placement of X-flow™ as a liner at the bottom of the large cavity

X-flow™ is now applied into the bottom of the cavity (as a liner) in a continuous procedure to avoid any inclusion of air and you can see that the product's consistency makes it very easy to place, whilst still within the practitioner's control.

We use the opaque shade O-A3 to mask the dentine that has a grey discolouration caused by corrosion of the amalgam.

We apply a second layer of X-flow™ into the mesial section. Here again, we have selected the O-A3 opaque shade. This shade will be polymerised for 40 seconds.

Placement of Quixfil™, Posterior Restorative

Quixfil™, the newest Posterior Restorative from Dentsply will be used to complete the entire occlusal filling and we require only very few steps to fill the whole cavity due to the fact that this material can be polymerised in deep layers (up to 4 min at once, cured in 10 sec).

The composite is spread out using a condenser and the final increment will be used to shape the occlusal surface.

As you can see, the material never sticks to the instruments, which makes placement a lot easier and faster.

Finishing and polishing with PoGo™, One Step Diamond Micro-Polisher

The finishing of the restoration is done classically using first a finishing bur, mounted on a contra-angle (this permits us to eliminate excess material and to reconstruct good occlusal anatomy).

We can see here the finishing step of the second molar and the subsequent polishing. A single polishing instrument, such as PoGo™, lets us obtain a good shine on the various fillings.

Final view of the finished restorations

We can now see all the fillings in place, how they fit, and the excellent quality of the anatomic reconstruction. Cosmetically, they show a good integration and adaptation to the surrounding teeth. It is especially true with the tooth 6, due to the presence of the opaque shade of X-flow™ that has masked the unsightly discolouration caused by the amalgam.

On the post-operative X-ray, the difference in radio-opacity between materials is visible: X-flow™ is clearly less radio-opaque than QuixFil™. However, we can reckon that the radio-opacity is much the same as enamel.

Conclusion

To conclude, we have seen how easy it is to use the flowable composite, X-flow™ in three totally different clinical situations:

- In a premolar, we experienced the ease of insertion of the X-flow™ Universal Flowable composite into a distal cavity without opening the marginal crest.
- In the second molar, we were able to apply the flowable material X-flow™ directly into a small cavity with a very small opening without risking the inclusion of air bubbles
- Finally, in the first molar, we used the flowable restorative material X-flow™ as a liner at the bottom of the cavity.

In all cases we obtained total satisfaction with the quality of the restorations realized with the two materials X-flow™ and Quixfil™.