

**Class IV Restoration with a layering technique**

Length (full film): 19 Minutes

**Introduction and original clinical situation**

This sixty-year-old patient has several composite restorations that exhibit marginal micro leakage and look quite unsightly. This case will present how to treat the teeth with the Esthet•X® Micro Matrix Restorative, in a simplified layering technique. On the palatal view, you can see the extent of these fillings that have been replaced several times due to high abrasion.

**Dentsply products used in this film:**

Nupro®, Prophylaxis Paste  
Esthet•X®, Micro Matrix Restorative  
Aquasil Soft Putty, Quadrafunctional Siloxane  
Prime&Bond®NT, Nano-Technology Dental Adhesive  
PoGo™, One Step Diamond Micro-Polisher

**Preparation steps****1 Shade selection**

The first step consists of selecting the shade using the shade guide supplied in the kit. As you see, the selected shade – in our case A3 – is provided in 3 variations: opaque, enamel and body shade: Our simplified layering technique will use all 3 variations.

**2 Creation of a Silicone key**

First of all, from Aquasil Soft Putty, we make a silicone key for the anterior teeth that will slightly overlap onto the labial surfaces. After setting, this silicone key is removed and the quality of the impression is checked. We trim it down so that it reaches up to the incisal edges only. The backside of the silicone key for example palatally, is then cut down, largely to allow easy reinsertion; the key is now much smaller and takes less space in the mouth. This is important, as we will restore the teeth under rubber dam. The silicone key is now repositioned to check that it fits and then put carefully aside, so that we can reuse it later for the restoration of the palatal surface.

**3 Rubber-dam and Cleaning**

The rubber-dam is placed classically: we start by setting a clamp on a premolar and enclose all anterior teeth to ensure good visibility and good instrumental access. We place over all the anterior teeth and therefore get very good visibility and accessibility to the entire anterior zone.

The silicone key is placed in again to check that it still fits. Now, with the dam in situ, we begin by polishing the whole area by means of a pumice and a prophylaxis paste – here, Nupro®, so that we can work under optimum conditions in terms of cleanliness and hygiene.

**Removal of old restoration**

Using a diamond bur – reference 830 – we now remove the old fillings, working in small steps in order to avoid touching any residual dental tissue. We check that all the composite material is also removed palatally, in particular in the areas where we had noted leakage.

Here, you can see all the burs we need to work with - this oval bur enables us to recreate the concave anatomy at the palatal side. This gives us good access with the instrument and improved visibility of the preparation margin. Another bur, a flame, helps us to create a straight bevel at labial side: this will contribute to an aesthetic result with a smooth transition between the composite material and the dental tissue.

We proceed with small movements to ensure we always know where the margin of the filling is. We take great care to make a definite proximal bevel to gain the maximum benefit from the polymerisation shrinkage of the composite that will seal the filling against the tooth tissue. We then proceed in the same way with tooth number 11, with a straight bevel, taking care to get a clear and visible margin after drying. We bevel the proximal part accordingly.

Here you can see the prepared cavities and the bevels that we will pre-condition, starting with the application of the etching gel.

**Etching**

This etching gel is carefully applied to avoid etching the adjacent teeth. It is important to sufficiently condition all surfaces to make sure we get proper adhesion and good marginal seal, and avoid the appearance of ugly discolorations later.

We then apply the gel onto the cavity walls: leave the surface undisturbed for 30 seconds, then remove the gel by aspiration and rinse thoroughly. After drying, but not desiccating, the properly etched enamel should have a dull, frosty white appearance.

**Placement of Adhesive**

The Prime&Bond®NT, Nano Technology Dental Adhesive system, combines a primer and an adhesive in the single bottle, for a great consistency of adhesive performance. It is applied onto the two teeth simultaneously and the solvent evaporates very quickly due to the presence of acetone.

This adhesive system contains nano particles, ensuring superior marginal bond strength and protection against micro-leakage. The visco-elastic properties of this adhesive system gives better resistance in stress bearing situations; this is particularly important for us as we will have to place large restorations.

The adhesive system is light cured on all surfaces. We are now going to place the first composite layer: we select the enamel shade, which, with the aid of the silicone key, will be exclusively applied onto the palatal surface.

## Placement of Esthet•X® composite

### 1 Enamel shade on palatal side

The composite is dispensed directly onto the silicone key, and we make it a bit more fluid by tapping it with a spatula. Here, we create here a palatal wall that will be the support onto which we build up the whole restoration. This will give us an anatomical and cosmetically pleasing filling. This first layer is light cured and you can see that, even though it is very thin, the support is perfectly adequate to be used as a base for the rest of the restoration.

We use the same procedure on tooth number 11, avoiding contact between the two fillings. Notice how translucent the enamel shade of the palatal wall is. We can now start to apply the opaque shade. The essential function of this shade is to build a screen against incidental light and to mask this zone at the margin between the composite and the dental tissue. Due to the lack of opacity, this zone is always an unsightly area.

### 2 Opaque shade

We then move back to tooth 21 and rebuild it as if we were preparing a core for a fixed crown, as shown in the enclosed drawing. This means that we will place the opaque shade in such a way to maintain sufficient space for the other increments of the body shade. The problem is basically the same on tooth number 11, with one small difference. We see the distinct dark mark of an oblique fracture. We must mask this fracture with a thicker layer of the opaque shade.

You can see it here: the spatula sticks the opaque shade onto this fracture mark and masks it. Here, you can see how much space remains labially for the body and enamel shades. A very thin matrix is inserted to achieve separation between the two fillings and is maintained by a wooden wedge.

### 3 Body shade

We can now start with the placement of the body shade. You can see that Esthet•X®

is a relatively firm composite that becomes more fluid when you tap it from time to time with a spatula. This allows the operator to sculpt it and create the desired anatomical form easily. This is demonstrated here: after a few taps with the spatula the material gels and gets a homogeneous consistency. You can move the material as a bulk, for example here to rebuild this central labial area.

We are still with the body shade and with 3 increments we are going to build the 3 following crests: a central, a mesial, and a distal.

The incremental layers will give us some relief on the labial surface, before we cover them with the enamel shade. Enamel will be the last shade used on the labial surface of this filling.

Each increment is carefully light cured. From a cosmetic point of view, it is important to take into account the whole anterior section to ensure a good match and correct orientation in terms of the labial axis. It is particularly important to judge the increments from a finite distance to make sure to get a good adaptation to the surrounding teeth.

### 4 Enamel shade (labial surfaces)

We can now see placement of the enamel shade that covers the entire labial surface. Again, just by tapping it, the material becomes more fluid and we sculpt it under steady pressure but never spreading it in order to avoid air inclusion, as that would be disastrous when we reach the polishing stage. Some deficiencies can be remedied at this stage to improve the cosmetic aspect of the filling. In case of overfilling as we see here on the mesial surface of tooth number 21, it is preferable to take it off - simply using an abrasive metal strip - before filling the tooth number 11.

The matrix is now placed against the tooth 11, as usual maintained with a wooden wedge, and we can proceed using the same method as for tooth 21, by applying the body shade to form first a mesial crest. Note that the consistency of the material becomes more and more homogeneous as we work on it. On the central area, the material is still applied under steady pressure but never spreading it and, using the spatula, we continue to sculpt it until it looks homogeneous.

The third crest is seen at the most distal part. A few anatomical corrections might be needed at this stage to ensure perfect symmetry of the two central incisors. Cosmetically, this is really the situation, where one wants to obtain optimum symmetry. We cover all the different increments placed on this labial surface with the enamel shade. By pushing and/or pressing the material, we are able to place it over all the labial side.

Here, some retouching is carried out at the incisal edge with the application of small increments and completion of our restoration.

### Finishing steps

The matrix is removed and the finishing procedure can start. We use the same bur as the one used previously to shape the labial bevels, for example, a red ring flame bur mounted on a contra-angled hand piece. This allows us to better control pressure on the instrument with a turbine. We can adjust the amount of spray to better evaluate how much convexity we want to maintain during the finishing stage. Too much spray would damage the visibility. This bur is also long enough to help in the orientation of the different crests created on the vestibular surface.

On the palatal surface, we use the ovoid bur enabling us to achieve the finishing step easily.

The morphology of the interproximal surfaces is pre-formed with a metal diamond strip in order to obtain symmetry of the cervical embrasures. It is clear that this strip cannot pass the contact point. This area need only be polished since it is less invasive.

### Polishing steps with PoGo™ and conclusion

Final polishing is obtained with the different forms available within the PoGo™ system; here, the cup polishes the vestibular surfaces as it also penetrates into the inter-proximal spaces.

This shape is particularly well adapted for labial surfaces. However, the disc is better suited for the incisal edge as it gives us better access and the possibility of maintaining good symmetry of these edges. The point gives the best finishing results on palatal surfaces.

PoGo™ is used here without spray so we have good visibility on all surfaces we polish.

Residual parts of the polishing paste are eliminated with a water spray. After having removed the rubber dam, all we have to do is check the articulation in centric and excessive movements.

### Conclusion

Look at these fillings now that they are fully completed, and see how satisfied our patient is with the result. The excellent lustre and shine obtained in the restorations are due both to the PoGo™ system and the quality of the Esthet•X® Micro-Matrix Composite. The presence of nano-particles within the resin matrix improves the

surface condition of this composite. The tooth was restored following the natural anatomy, using the three opacities available within the Esthet•X® system (Opaque, Body and Enamel shades). The final esthetical result is fully satisfactory.