Direct and indirect restorations successfully combined

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In aesthetic dentistry, it is essential not only that the patient's beautiful smile be restored, but also that the restoration be lasting. The advances in adhesive technology have encouraged clinicians to use composite resin for the replacement of missing tooth structure. Modern dentistry offers us a wide array of different materials, techniques and procedure options to satisfy patients' needs.

In mimicking the shade of teeth, dentists attempt to restore what is missing in a natural way. In order to achieve successful treatment outcomes, we need materials that are similar in their light-reflective qualities to the missing tooth structure, that is, the replacement of dentine with a dentine substitute and of enamel with an enamel substitute. This article describes how the various materials can be used to achieve highly aesthetic restorations in the anterior and posterior dentition.

Clinical case

An 18-year-old female patient presented with toothache, multiple carious lesions and discoloration in the anterior and posterior teeth (Figs. 1 & 2). She had undergone numerous dental procedures in the past and had a history of orthodontic treatment, in which her mandibular first premolar teeth were extracted. The primary goal was to relieve the patient's pain. Therefore, several teeth had to be endodontically treated. Afterwards, the old posterior PFM crowns were removed and replaced with all-ceramic crowns (IPS e.max Lithium Disilicate, Ivoclar Vivadent). In addition, the various lesions in the posterior region were restored with a direct resin restorative (IPS Empress Direct, Ivoclar Vivadent).

After successfully completing treatment in the posterior teeth, we focused on the reconstruction of the anterior teeth. Having considered all the various restorative options, we opted for direct restorative treatment with composite-resin veneers.

Veneers made from composite resin

Anesthetic local anesthesia, carious tissue was excavated with high-speed diamond burs and slow-speed round burs. A flame-shaped diamond bur and coarse finishing discs were used to prepare the fine details in the cervical area and on the labial surface of the teeth. On the labial surface, we reduced only 0.8 to 1 mm to preserve as much natural enamel as possible. A short bevel was prepared at the amelodental junction in the cervical region and also in the incisal area of the proximal cavities (Class III preparation).

Subsequently, the prepared surfaces were thoroughly rinsed with water.

As there were Class III cavities, we completed these restorations first (Fig. 3), followed by shade selection. Then, direct veneering with IPS Empress Direct composite material was performed. For this purpose, the prepared maxillary central incisors were etched with 37% phosphoric acid gel (Total Etch, Ivoclar Vivadent) for 15 seconds (Fig. 4). Neighbouring teeth surfaces were protected by covering them with Teflon tape.

After etching, the teeth were rinsed with water and dried, taking care not to dry them to the point of desiccation. Subsequently, the total-etch adhesive ExciTE F was applied using the VivaPen (Ivoclar Vivadent) and brushed into the enamel and dentine surfaces for ten seconds (Fig. 5). A gentle stream of air was used to disperse the excess into a thin layer. Then the adhesive was light-cured for ten seconds with the Low Power mode of the Bluephase 20i curing unit (Ivoclar Vivadent). A putty matrix was prepared from the wax mock-up on the stone model (Vitral Putty, Ivoclar Vivadent). Once placed in the patient's mouth, it would be used as a spatial reference and 5.5 D guide for the placement of the composite-resin veneers. After positioning the putty matrix on the teeth, the first layer of composite resin (IPS Empress Direct Trans 30) was placed on the incisal edge and the proximal aspects of the palatal surface (Fig. 6).

The putty matrix was finally removed and the cervical area built up with a layer of IPS Empress Direct Dentin A2, extending it to the middle of the incisal third (Fig. 7). Small dentinal lobs were prepared in the still-soft composite resin using the OptarSculpt and sculpting instrument (Ivoclar Vivadent). After polymerising this dentine layer, the grooves created between the lobes were filled with a highly translucent material (IPS Empress Direct Opal) and light-cured for 15 seconds using the Soft-Start mode of Bluephase 20i.

A layer of IPS Empress Direct Enamel A3 was used to complete the labial surface from the middle of the incisal third to the incisal edge (Figs. 8 & 9). The last layer of this veneer restoration was IPS Empress Direct Trans 20 composite, which was applied to the entire labial surface in a thin layer. The final anatomy was sculpted using OptarScult and a brush. The same procedure was repeated on the neighbouring tooth.

The proximal contours were carefully sculpted to develop proper areas of deflection and reflection of light, taking care to maintain the symmetry between the right and left maxillary central incisors. The other teeth affected were restored in a similar manner.

After considering the primary anatomy, the secondary and tertiary anatomy was crafted using the ultrafine finishing burs. The Astrobrush and Astrobrush finishing and polishing systems (both Ivoclar Vivadent) were used to impart a high lustre while maintaining the previously created surface texture and anatomy (Fig. 10). The patient was extremely happy with her new, beautiful smile (Figs. 11–14).

Conclusion

Aesthetic restorative dentistry strives to reproduce the natural anatomy, translucency and characteristics of natural dentition. In the clinical case presented, interdisciplinary procedures along with the proper selection of materials helped the clinician to achieve the desired result. The combination of a direct adhesive technique in the anterior region (IPS Empress Direct) and an indirect technique in the posterior region (IPS e.max Lithium Disilicate) allowed the creation of long-lasting and natural-looking restorations. The patient was extremely happy with her new, beautiful smile.