Aesthetic restoration created with composite

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Fig. 1

Fig. 2

Fig. 3

Fig. 1_Pre-op situation.
Fig.2_Absolute isolation of the operating field with a rubber dam is the ideal form of moisture control.
Fig. 3_Preparation of a small circular chamfer.

_The new generation of resin composite materials in combination with modern layering techniques allows today's practitioners to treat their patients with minimally invasive, highly aesthetic direct restorations. Owing to their enhanced properties, these materials produce results that are hardly distinguishable from natural dentition, especially with regard to colour, which is particularly desirable in anterior teeth.

The new composite IPS Empress Direct (Ivoclar Vivadent) enables us to create restorations that are almost invisible to the human eye. The appropriate increment technique together with correct handling of the materials and high-gloss polishing produces predictable, aesthetic results directly in the mouth. Owing to its nano-hybrid structure, the material can also be used to restore posterior teeth.

IPS Empress Direct materials are available in various levels of opacity, translucency and brightness. By combining the different materials, tooth-like light scattering can be achieved. The working steps of the technique used to place IPS Empress Direct are described in this article.

_Clinical case: Step-by-step restorative procedure

A young patient presented with a defective resin composite filling in tooth #11. The margin was no longer tight and the interface between the tooth structure and the restoration exhibited staining. What is more, the chroma, opalescence and shade of the filling did not correspond to that of the natural dentition (Fig. 1).

According to the treatment plan, the filling would be removed, the cavity prepared along minimally invasive principles and the tooth restored with a direct resin composite. In order to achieve impeccable integration of the restoration in the oral environment and an aesthetic smile line with a uniform colour, the composite would have to be placed using the increment technique. As the cavity had walls on all sides, there was no need to create a wax-up or a silicone template to restore

Fig. 4

Fig. 5

Fig. 4_Etching with 37 % phosphoric acid.
Fig. 5_Application of the adhesive.

Fig. 6

Fig. 7

Fig. 8

Fig. 9

Fig. 6_Application of the dentine material in the appropriate shade, that is, the appropriate translucency/opacity.
Fig. 7_Application of the opalescent material in the enamel part of the tooth.
Fig. 8_Application of the enamel material on the entire facial part of the restoration.
Fig. 9_Restoration one week after it was placed.

the tooth shape. A layering scheme was established before the treatment was begun.

During the dental examination, the general preoperative situation, the natural colour of the patient's teeth and individual characteristics were photographically documented. The layering scheme was prepared on the basis of the photographs. The different materials that would be used for the restoration were established in the process. In order to reproduce the special characteristics of the patient's tooth anatomy, the appropriate dentine and enamel shades were selected along with an opalescent material and a white-opaque material (from the IPS Empress Direct range).

At a second appointment, the operating field was isolated with a rubber dam, since absolute moisture control is indispensable in the placement of resin composites (Fig. 2). The outer margins of the old filling were traced with a pencil. This was done to highlight the transition between the filling and the tooth structure in the removal of the old filling. A small chamfer was prepared on the vestibular side, as this is indicated for this type of restoration (Fig. 3). Next, the enamel and dentine were etched with 37 % phosphoric acid (Total Etch) and a three-component adhesive (Syntac) was applied (Figs. 4 & 5).

In order to obtain the desired tooth shade, the dentine part of the restoration was built up first with dentine material (IPS Empress Direct Dentin A2; Fig. 6). A translucent and opalescent material (Trans Opal from the IPS Empress Direct range) was used to build up the enamel part (Fig. 7). Thin white-opaque strips (IPS Empress Direct Bleach XL) were applied over the dentine segment to enhance the brightness. Finally, an appropriately shaded enamel material (IPS Empress Direct Enamel A2) was placed over the entire facial surface of the restoration to cover all the previously placed materials (Fig. 8). The creation of surface texture as well as finishing and polishing are important working steps in imparting a restoration with a true-to-nature appearance. As a result, they have to be given due attention. In the present case, the surface texture was created with diamond burs at low speed. This allowed the procedure to be precisely controlled. A three-step silicone polishing system (Astropol) was used to finish and polish the restoration. Finally, the restoration was polished to a high gloss finish using aluminium oxide, diamond pastes (Shiny System, Micerium), brushes and felt wheels.

It is worthwhile recalling the patient for a third appointment to ensure that the restoration blends into the natural environment when the tooth is moist and to establish whether any shape or colour adjustments need to be made (Fig. 9)._

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