

# Different restorations, same material

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A thorough knowledge of the latest ceramic systems and adhesive luting techniques is all it takes to fabricate partial restorations according to biomimetic principles.

In many clinical situations, a combination of full and partial restorations is indicated. In order to fulfil (bio)mechanical, functional and esthetic requirements, it is of utmost importance to select the most suitable ceramic materials for the case at hand.

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## Preoperative situation

The 28-year-old patient consulted our office about "improving her smile". She was particularly concerned about the appearance of her four upper front teeth (shape, position, colour, surface texture). Unfortunately, the patient did not wish to undergo any orthodontic treatment. Theoretically, this would have offered an elegant solution to realigning both the upper and the lower tooth arch. Nevertheless, the patient's wishes must always be respected. Therefore, another approach had to be found to meet her needs.

Tooth 11 and 21 had previously been restored with PFM crowns. However, these two restorations looked very bulky. Therefore, the two lateral incisors, tooth 12 and 22, appeared to be pushed back (Figs 1 and 2). The patient had very bright teeth, which would have to be appropriately imitated by applying internal highlights (Fig. 3).

## Treatment plan

On the basis of the esthetic treatment plan, a mock-up of the restoration was fabricated with a tooth-coloured composite resin. We refer to this structure as an "anterior matrix". It was used to establish the desired outcome together with the patient: The pushed-back position of the lateral incisors would be restored with veneers following minimal preparation and the central incisors with new crowns.



Figure 1: Preoperative situation viewed from the front.



Figure 2: Preoperative situation viewed from the side.



Figure 3: The exceptional luminosity and brightness of the anterior teeth was established during shade selection.

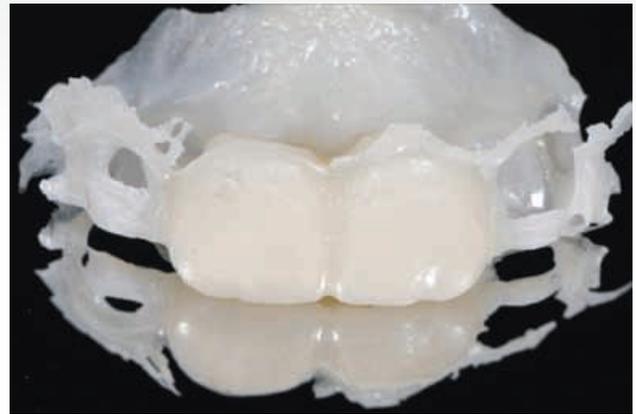


Figure 4: The tooth-coloured mock-up gave an indication of how finely the two lateral incisors would have to be prepared.

### Preparation

The lateral incisors were minimally prepared in accordance with the anterior matrix (Figs 4 and 5). The space available for the new restorations was shown to be ideal after the PFM crowns were removed from tooth 11 and 21. Furthermore,

an adequate amount of tooth structure remained, which would provide biomechanical reinforcement for the two central incisors (ferrule effect) (Fig. 6). Therefore, we decided to place the new ceramic restorations according to an adhesive luting protocol.



Figure 5: The margins were finished after minimally invasive tooth preparation.



Figure 6: View of the four prepared teeth.



Figure 7: The chroma of the prepared teeth, 11 and 21, was determined (IPS Natural Die Material shade guide). The selection of the appropriate press ingot required considerable care and deliberation ...

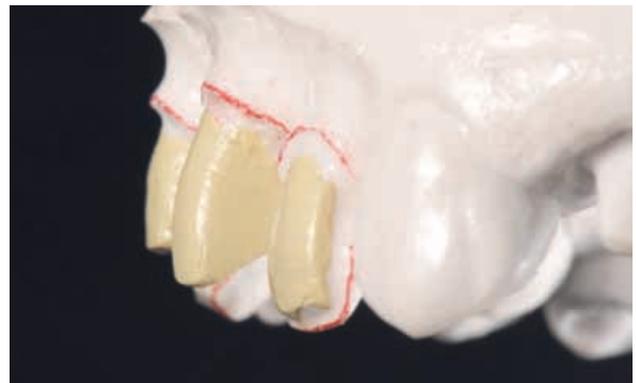


Figure 8 ... since the restorations were of varying thicknesses. The difference in the preparation depth of the lateral and the central incisors is clearly visible.

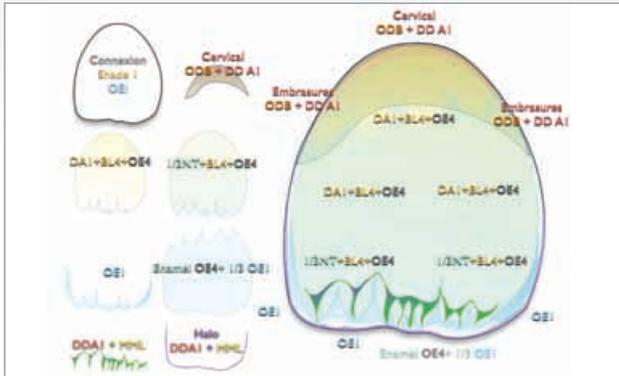


Figure 9: A sketch of the esthetic features served as a guideline for the restoration build-up.



Figure 10: Layering scheme taking esthetic planning aspects into consideration.

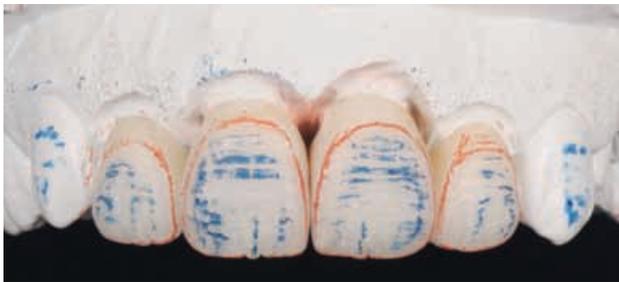


Figure 11: Creation of the tooth shape and the surface texture on the model.



Figure 12: The surface texture of the restorations was checked by applying a fine layer of powdered gold.

### Selection of the press ingot

The dental lab technician selected a suitable press ingot (IPS e.max® Press) based on the information that was available about this case (colour of the enamel and the tooth core, etc.) (Fig. 7).

The challenge was to select an ingot that would accommodate both the crowns for the highly chromatic and luminous central incisors and the thin veneers for the light lateral incisors (Fig. 8).

A medium opacity ingot (MO) was chosen for the following reasons. When maximum brightness is desired in restorations on intensively coloured bases, as is the case in the two incisors, we generally choose an ingot of the MO type. These ingots provide a medium level of opacity, which offers good masking properties, and a high degree of fluorescence. The minimally prepared teeth, however, do not provide a binding colour for the partial restorations. Therefore, a more translucent type of ingot would impart a



Figure 13: The four anterior restorations were seated with adhesive luting composite. As a result of the existing occlusal conditions, the incisal edge was relatively easy to create and imparted considerable personality to the smile.



Figure 14: Final picture. The crowns and the veneers have the same colour.



Figure 15: The black-and-white picture allows the four ceramic restorations to be assessed in terms of value.



Figure 16 and 17: The situation six months after the treatment.

greyish appearance to the relatively thick lithium disilicate veneers. Due to this second point, we prefer to use a fluorescent (MO) ingot in order to ensure the appropriate brightness of the restored teeth. The restorations were fabricated using the familiar press technique.

Due to their opaque characteristics, IPS e.max Press MO ingots are ideal for producing substructures for the restoration of vital, lightly stained teeth. They provide an excellent basis for lifelike restorations as a result of their true-to-nature fluorescence.

### Veneers

Since the patient had very intensively coloured gingival tissue and dark red lips, the tooth necks had to be saturated with IPS e.max Ceram Occlusal Dentin Brown and Deep Dentin A1, despite the selected A1 shade (Figs 9 and 10). This ensured a smooth transition between the tooth necks and the restorations. A large amount of information, which was extremely helpful in the subsequent finishing work, was

conveyed to the dental laboratory by means of closeup pictures of the teeth and gingival tissue as well as of the patient's face (portraits showing various natural facial expressions). The surface texture and the shape of the teeth (Figs 11 and 12) were carefully recreated. Then the restorations were prepared for placement.

### Conclusion

When we seated the restorations, we saw that our treatment strategy had proved to be a success. The teeth blended in smoothly with the dentition. The overall impression was very harmonious (Fig. 13). The ingot which had been selected also showed to be ideal for this case. No difference in the shade could be distinguished between the two crowns on the central incisors and the adjacent veneers (Figs 14 and 15). A highly esthetic solution was achieved with minimally invasive tooth preparation (Figs 16 and 17).

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