

Radiant, beautiful anterior teeth

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Fig. 1_Pre-op view.

Fig. 2_Mock-up.



_The loss of the interdental papillae is a grave consequence of periodontal disease. Surgical reconstruction is still not feasible. There are several approaches to reducing or masking the black triangles that occur as a consequence of the missing papillae. Conventional restorations are an option if the teeth also show increased mobility. If this is not the case, that is, if the periodontal tissue is healthy, it is crucial to find a biomimetic solution, meaning that the restoration should take aesthetic, biomechanical and biological factors into account.

_Initial situation

The treatment of missing papillae by means of ceramic veneers will be presented on the basis of a clinical case. A female patient around the age of forty was unhappy with the look of her smile, which she described as "disgraceful". The aesthetic diagnosis consisted of an analysis of the features of the face, the smile, the teeth and the gingiva. The analysis (Fig. 1) revealed the following findings:

- _face:** tense and shy look due to self-consciousness about her teeth;
- _smile:** considerable aesthetic compromises due to the black triangles;
- _teeth:** healthy triangular, curved teeth; the margins of the roots are visible;

- _gingiva:** healthy periodontal tissue; interdental papillae are missing; the teeth are stable; recess at tooth #12; and
- _radiological examination:** regular alveolysis in the cervical third.

_Procedure

The following procedure was determined on the basis of the analysis:

- _surgical intervention** at tooth #12 in order to increase the gingiva (transplantation of connective tissue);
- _fabrication of a mock-up** in order to visualise the final result;
- _tooth preparation** on the basis of the mock-up;
- _temporisation;**
- _try-in of the veneers** (adaptation, shape and shade); and
- _incorporation of final restoration.**

_Treatment course

Surgical intervention to increase the gingiva

Connective tissue was removed from a lobe that was moved towards the tooth crown. Before further treatment was conducted, a four-month healing phase was necessary.

Preparation of the mock-up

A silicone matrix was fabricated on the basis of the wax-up, which was based on the findings of the aesthetic analysis. The temporary restorations were fabricated with the help of the matrix from a self-curing, flowable Bis-GMA-based composite. This allowed us to discuss the restoration beforehand with the patient, who provided her input and approved of the restoration (Fig. 2).

Preparation

In order to keep the depth in check and observe the biological concept, the drill was placed directly on the mock-up. With this procedure, a uniform thickness of approximately 0.5 mm is achieved on the basis of the volume of the final restoration.¹ After removing the preparation key (mock-up), the presence of larger, non-prepared enamel areas is observed. In the present case, the treatment protocol was slightly varied in view of the cervical preparation margins: usually, the preparation margins are located above the gum line for veneer preparations; in this case, however, the margins had to be designed sub-gingivally (Fig. 3).

This approach was chosen for various reasons: in order to eliminate the black triangles, meet the biological requirements (cleaning and soft edges) and consider the biomechanical properties of the ceramic (prevention of non-supported areas in the ceramic), only one single



Fig. 3

contact surface with a soft transition from the edge of the root to the margins of the contact surface could be designed to mask the missing papillae (Fig. 4).

The all-ceramic veneers were fabricated with the IPS e.max Press (MO1) lithium-disilicate glass-ceramic material and the incisal third was veneered with IPS e.max Ceram (both Ivoclar Vivadent). The pressed veneers, which showed a minimum thickness of 0.3 mm, feature a high stability and outstanding accuracy of fit on the one hand and excellent light-optical properties on the other.

Try-in of the IPS e.max Press veneers

After removing the temporary restorations, all veneers were tried in simultaneously. This enabled the overall appearance to be visualised. Subsequently, the accuracy of fit was checked. Variolink Veneer Try-In paste (Ivoclar Vivadent) was used for this procedure in order to simulate

Fig. 3 Preparations with sub-gingival margins in the proximal region.



Fig. 4



Fig. 5



Fig. 6



Fig. 7

Fig. 4 Checking the relation between the preparations and the volume of the final restoration with the help of a silicone matrix.

Fig. 5 Isolating individual teeth in order to achieve optimum bonding.

Figs. 6 & 7 Lateral view of the IPS e.max Press veneers from right (Fig. 6) and left (Fig. 7).



Fig. 8

Fig. 8 Frontal view of the restorations; an expansion of the interdental papillae can be observed.



Fig. 9

Fig. 9 View of the maxillary teeth; the optical properties of IPS e.max Press material are particularly highlighted in this image.

the effect of the cementation material on the shade of the restoration.

Clinical procedure

The veneers were individually cemented using the adhesive technique, starting with the inci-

the distance between the contact point and the tip of the papilla had to be less than 5 mm in order to allow the papilla to grow back.² After some months, the papilla will have grown and filled the small spaces that were reserved for it. This is also a confirmation of the bio-compatibility of the lithium-disilicate glass-ceramic IPS e.max Press (Figs. 9 & 10).



Fig. 10

Fig. 10 Light transmission through IPS e.max Press veneers.

sors (Fig. 5), followed by the lateral incisors and canines and so on, thus allowing the clinician to carry out corrections on the proximal areas of the less prominent teeth (distal surfaces of canines or premolars). The restorations were conventionally placed with Variolink Veneer (Ivoclar Vivadent). In a last step, the composite joints were carefully finished with a scalpel in order to maintain the surface gloss of the ceramic and the excellent fit in the periodontal tissue (Figs. 6–8).

Conclusion

Clear communication between the dentist and the dental technician is mandatory in clinical cases such as this to allow as much information as possible to be exchanged (models, images of the initial situation, images of the preparations and their shade, impression of the temporary restorations in place, shade determination). In the present case, the ceramist designed the margins of the contact surfaces on the stone model 2 mm from the papilla because

By strictly observing the treatment strategy and using materials that show optimum optical and biomechanical properties, the patient's smile was modified and restored in accordance with the principles of minimally invasive dentistry.

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Editorial note: A list of references is available from the publisher.

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