

Conservatively placed veneers to correct a diastema

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Introduction

Today's patients expect restorations that not only function properly, but are also highly esthetic. Unlike some years ago, different media outlets today afford patients greater knowledge and insight into the possibilities and the potential of modern materials and treatment. They expect us to achieve optimum outcomes when designing their smile, and rightly so. The most significant goal, however, still is the restoration of oral health in the most conservative way.

When choosing a treatment option, dentists and technicians must satisfy not only the clinical requirements, but also the expectations and goals of the patients. In cases when patients decline orthodontic treatment, adhesively bonded porcelain veneers are a viable treatment option to modify the appearance of tooth position and form, to close diastemas or cervical embrasures or to change the tooth shade. Porcelain veneers are one of the best restorative treatment options available from biological, functional, mechanical and esthetic perspectives. Preservation of enamel is one of the main concerns if such a treatment is envisaged.

The conventional laminate veneer techniques often require aggressive removal of dental tissue, which goes against the principles of conservative dentistry. New techniques and materials allow esthetically pleasing and functionally long-lasting restorations to be produced while limiting tooth preparation. By using diagnostic guides, such as a wax-up, and a fluorapatite glass-ceramic material (IPS d.SIGN), dentists and dental technicians can fabricate

minimally invasive ceramic veneers and thus provide their patients with lifelike, esthetic restorations which also meet the functional criteria.

Case presentation

A 52-year-old woman presented with complaints about the shape and size of her maxillary centrals, and she wanted the midline diastema closed (Figure 1). After discussion with the patient, it was decided that porcelain veneers (IPS d.SIGN) would be placed on teeth 11 and 21. We wanted to apply a conservative protocol to fulfil the patient's wishes.

Leucite-reinforced fluorapatite layering ceramic (IPS d.SIGN, for instance) is ideal for bonded ceramic restorations such as veneers. The material's special qualities include outstanding optical properties and wear behaviour. The physical properties are very close to those found in natural teeth. As a result, IPS d.SIGN is the material of choice for treatments requiring conservative veneers.

By using a direct layering technique on refractory dies, laboratory ceramists can provide their customers and patients with restorations which display the vitality and fluorescence required to make them indistinguishable from



Figure 1: Initial situation: What some people see as a sign of beauty, others may see as a flaw; the patient disliked her diastema between teeth 11 and 21.

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Figure 2: After conservative preparation, the shade was determined (A1).



Figure 3: The working stone model for the creation of the veneers.

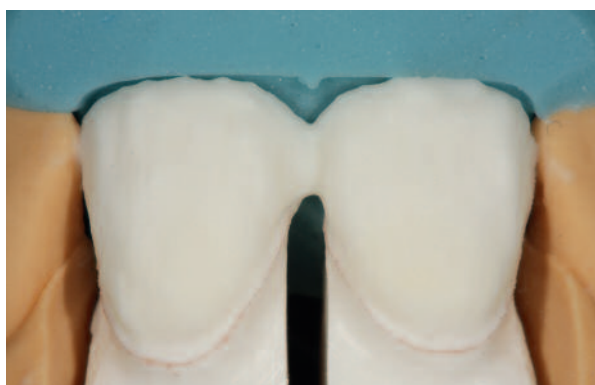


Figure 4: The material was layered on refractory dies. The silicone matrix fabricated on the basis of the wax-up was used as a guide.



Figure 5: Quality dentin materials together with excellent technical and manual skills are required to create tooth-like veneers made up of many individual layers.

natural dentition. With increased brightness, higher shade consistency, natural opalescence and a wide range of characterization options this glassceramic material enables professional creativity when addressing a variety of restorative cases. Additionally, the IPS d.SIGN porcelain enables dentists to limit the majority of the veneer preparation to enamel, thereby reducing the risk of overexposing dentin.

Clinical preparation

After the patient had accepted the treatment plan, the dental technician created a diagnostic wax-up. In order to observe the principles of conservative preparation, a purely additive technique was used. Wax was added to the model to build up the new tooth forms.

A resin matrix (mock-up) then was created from the diagnostic wax-up to allow the patient to preview the restorations prior to tooth preparation. After patient approval, the mock-up was used as a blueprint for enamel reduction. The patient was anesthetized and depth cuts were placed in the incisal and cervical third of the matrix.

Proper depth cuts were made with a diamond bur, using the matrix as a guide. The cuts were marked with a pencil for easy identification. The mock-up was removed and the necessary dental enamel for the veneer preparations was removed using large round-ended diamonds (Figure 2). Finally, the preparations were checked with vertical and palatal putty stents. These stents had been previously created from the diagnostic wax-up to ensure that the preparation is compatible with the veneer shape. The provisional restorations were inserted and checked. Particular emphasis was given to the embrasure form, where a space was left to allow the gingival tissue to fully recover after placement. The provisionals were spot-etched with phosphoric acid solution and luted with resin cement. The patient returned after a few days, a facebow was created, and the case was sent to the dental ceramist (Figure 3).

Laboratory procedure

The veneers were built up on the refractory dies using the IPS d.SIGN porcelain (Fig 4). Prior to the actual layering



Figure 6: The stratification is created by applying various brightness and translucency levels.

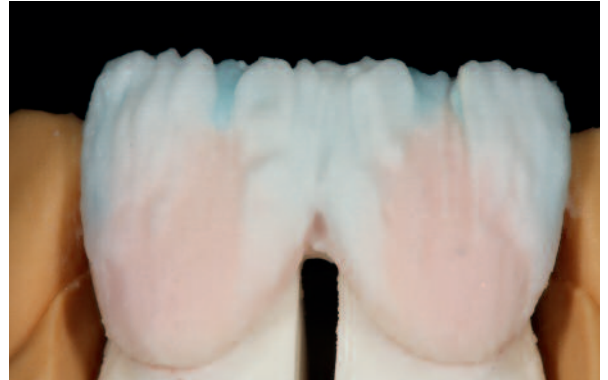


Figure 7: The dental lobes were created in the incisal area with some custom-mixed ivory- and cream-coloured materials, which were applied in thin layers.

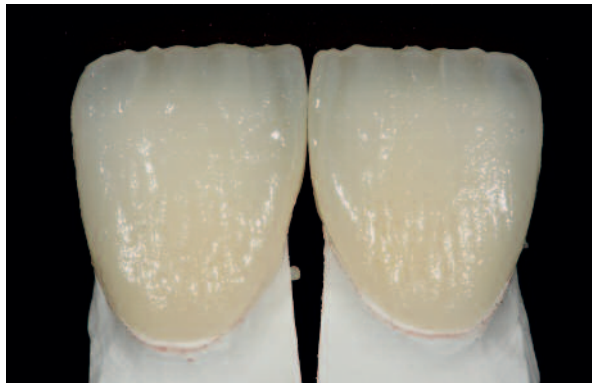


Figure 8: The baked veneers.



Figure 9: The entire porcelain surface was coated with silver powder to better assess symmetry and surface morphology



Figure 10: After thermal glazing, the restorations were mechanically polished.



Figure 11: The delicate ceramic veneers already looked impressive on the model.

procedure, margin material was applied in a thin layer as far as the margins and baked. Porcelain stratification was initiated by placing a deep dentin on the facial, interproximal and incisal areas. For the subsequent layering steps, the resin matrix from the wax-up served as a guide. The veneers were then built up using dentin layers of different values and translucencies with the appropriate dentin materials and manual skills (Figures 5 and 6).

Finally, the dental lobes were characterized by applying

thin layers of custom-mixed ivory- and creamcoloured intensive materials (Figure 7). A combination of translucent and opalescent enamel powders was used to cover the entire facial aspect of the veneers (Figure 8). After the initial bake, the veneers were checked on the master dies. The contours and shape were finalized and the veneers were baked for a second time (Figure 9).

Final contouring and surface texturing was completed with diamond burs and green stones (Figure 10). After the



Figures 12 and 13: The seated restorations.



Figure 10: Four weeks later, the follow-up examination showed a normal clinical situation.



Figure 14: Two years after treatment: The gingiva is healthy and the patient still happy.

final polish, the internal aspects of the veneers were etched with 9.5% hydrofluoric acid for 60 seconds. The thin veneers were then ready for seating and delivered to the dentist (Figure 11).

Final seating

Once the provisionals had been removed, it was important to polish the preparations with pumice and to thoroughly clean them subsequently. The veneers were tried in individually to inspect the fit and then collectively to optimally evaluate the contact areas. The veneers were placed using a try-in gel in order to give the patient a preview of the final outcome. The result was outstanding, and thus the veneers were definitively luted into place according to standard bonding protocol with a resin cement. After final polishing, the occlusion was adjusted and checked. The patient's expectations had been met: The restorations closed the diastema. The newly designed anterior teeth fulfilled the esthetic expectations of the

patient. Her smile was more relaxed and she looked more confident (Figures 12 and 13).

Conclusion

Bonded veneers can represent a minimally invasive treatment option. If the appearance of the anterior teeth is to be improved or modified, they are an attractive alternative to orthodontic treatment. The IPS d.SIGN fluorapatite material features properties which come very close to the optical and physical characteristics as well as the wear resistance of natural teeth. With this material, veneers can be fabricated which are virtually indistinguishable from natural dentition. The procedure discussed in this case allowed a conservative and highly esthetic veneer restoration to be fabricated. Both the patient's esthetic goals and the dentist's functional requirements were met (Figure 14).

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