The pros and cons of a smile makeover with indirect veneers

A clinical case of closing multiple diastemas in a 37-year-old female patient

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For quite some time, we have known about minimally invasive techniques for the aesthetic restoration of the oral cavity. Whether a patient wishes to have stains removed, teeth bleached or tooth shape and general appearance improved, the range of treatment options is almost limitless. Procedures include tooth bleaching, enamel micro-abrasion, direct composite restorations, and the whole spectrum of laminate veneer systems, ranging from full veneers, involving more aggressive preparation, and the different types of thin or micro-veneers to non-prep veneers and edge-ups.

In cases in which a major improvement in the shade and shape is desirable, indirect veneers are clearly the clinician’s first choice. Owing to their superior aesthetic and mechanical properties, indirect veneers are ideal when extensive aesthetic adjustments are required.

Before selecting a material, the clinician needs to be aware of the two main challenges of aesthetic oral restoration: selecting the proper shade and opacity of the material and determining the amount of tooth structure that needs to be removed in order to achieve the desired result. For example, in cases in which teeth are moderately to severely misaligned and orthodontic treatment is not possible, aggressive preparation will be needed. The same applies to teeth with heavy staining caused by fluorosis or tetracycline.

Multiple diastemas may be present when teeth are too small for the maxilla and mandible or after the patient has undergone orthodontic treatment to achieve an adequate Class I canine relationship. This is an ideal situation for minimally invasive treatment with thin, non-prep veneers, especially if there is no major discoloration and after the teeth have been prepared and the temporary restorations have been placed. These adjustments are then communicated to the dental technician before the final restoration is fabricated.

In the case of non-prep veneers, a direct mock-up can be challenging to fabricate and the final outcome difficult to visualise owing to the minimal thickness of the final restorations and the differences between the resin (used for the mock-up) and the ceramic (used for the final veneers).

Presentation and imaging software programs (which are easily available and affordable for everyone) present a novel option for simulating the final outcome, as they allow digital mock-ups to be created on the computer screen. This method is extremely easy, accurate and reliable.

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Fig. 1: Pre-op situation: Multiple diastemas were present. The patient’s wish was to have them closed. — Figs. 2a & b: The wax-up on the model with the gingival mask in place gave an idea of how the situation could be improved. — Fig. 3: A digital image of the wax-up was superimposed over a photograph of the pre-op situation; a digital mock-up was created. — Fig. 4: Full-contour veneers were pressed using highly translucent IPS e.max Press Lithium Disilicate (layer thickness of 200 to 300 µm). — Fig. 5: In the mandible, the diastemas were closed with lithium disilicate edge-ups.

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While a classical mock-up requires chair time of 15 to 20 minutes, the digital mock-up can be done in less than one minute by a dental assistant or technician, if usable clinical and technical images are available. By superimposing an image of the wax-up over the preoperative photograph, a digital image of the final result can be obtained. The only requirement is matching dimensions, inclination and perspective.

Closing multiple diastemata with non-prep veneers can be quite a challenging task. In most cases, the veneers will be extremely thin on the labial aspect but very thick mesially. While high translucency is required to “capture” some colour from the underlying tooth structure and thus ensure a natural appearance, the material also requires reasonable opacity in order to mask the darkness of the oral cavity shining through in the area of the diastemas. For a standard case, occlusal forces can be problematic if wide diastemas (1.5 mm and wider) are involved.

In recent years, the aesthetic properties of IPS e.max Lithium Disilicate glass-ceramic (Ivoclar Vivadent) have been significantly improved thanks to the introduction of different gradations of translucency. Nowadays, lithium disilicate ceramics can be processed using either CAD/CAM or press techniques. These materials are available in up to five different levels of translucency and show flexural strengths ranging from 560 to 400 MPa. For the case discussed in this article, IPS e.max Press HT (Ivoclar Vivadent), a highly translucent lithium disilicate glass-ceramic, was selected.

Clinical case report

A 57-year-old female patient dissatisfied with her appearance presented to our office. She did not like the multiple diastemata that showed when she smiled (Fig. 1) and was hoping for durable and predictable treatment options that did not involve any tooth preparation and could be done at a reasonable price. The patient had undergone orthodontic treatment before and teeth #11 to #21 had been restored distally with composite fillings. The gingiva was still slightly traumatised at this point.—Fig. 1: The function of the veneers was checked immediately after seating. The gingiva was still slightly traumatised at this point.—Fig. 6: The photographs taken one week after placement of the veneers. The mandibular teeth were subjected to a one-time bleaching process.—Fig. 7: After four weeks, the gingiva had healed completely.—Fig. 12: The final result after two months.

For the case discussed in this article, IPS e.max Press HT (Ivoclar Vivadent) provided assistance. Variolink Veneer (Ivoclar Vivadent) enable the clinician to make slight adjustments to the shade of the restoration. The High Value shades allow the shade to be lightened gradually, while the overlying all-ceramic material can be made progressively darker with the Low Value shades. For permanent cementation, a solvent-free bonding agent (Heliobond for enamel bonding, Ivoclar Vivadent) and a light-cured luting composite (Variolink Veneer, High Value +1) were used (Figs. 6–9).

Conclusion

The photographs taken one week after placement of the veneers showed their seamless integration with the surrounding gingiva. Two of the aspects always considered disadvantages of non-prep veneers are their bulky appearance and the resulting cervical transition between the veneer and the tooth structure, which can lead to periodontal problems in the long term. As shown in Figure 12, both issues can be controlled if the thickness of the ceramic layer is minimal and proper finishing and polishing are performed. Figure 13 shows the final result after two months.

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Fig. 6: The function of the veneers was checked immediately after seating. The gingiva was still slightly traumatised at this point. — Fig. 7: After four weeks, the gingiva had healed completely.—Fig. 12: The final result after two months.

The mandible, we faced a different challenge, as diastemata between the lateral incisors and canines were present on both sides. While the patient did not expect a dramatic change in the shade of her teeth, her main concern was the avoidance of any kind of tooth preparation. To meet her wish, we decided to restore her teeth with partial veneers (edge-ups). —Fig. 5: Traditional non-prep veneers would have increased the thickness of the lateral incisors and canines so that they would not have been compatible with...