



# Indirect porcelain veneers in periodontally compromised teeth. The hybrid technique: a case report

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## Abstract

The loss of periodontal structure causes an esthetic problem for many patients, especially when the esthetic zone is compromised. Among the various types of solutions is the use of composite resins. While this procedure is not aggressive towards tooth structure, it does require the clinician to have a precise technique, and demands strict long-term maintenance.<sup>1</sup> Another way of treating the compromised teeth is with porcelain veneers. This procedure is es-

pecially difficult, however, if carried out on periodontal teeth, as it requires preparation along the roots.<sup>2</sup> The intention of the hybrid technique described in this article is to combine both of these procedures in order to obtain a less aggressive treatment with precise management of the soft tissue and an adequate esthetic outcome. The hybrid technique consists of enlarging the root portion of the teeth with composite resin to obtain a less aggressive tooth preparation, and thereafter placing porcelain veneers.<sup>3,4</sup> (*Int J Esthet Dent* 2015;10:XXX-XXX)





### Introduction

A loss of periodontal support often causes an esthetic problem for patients (Fig 1). Periodontal health must be restored before any esthetic procedure can be carried out. Therefore, the issue of periodontal disease needs to be addressed first, with a series of treatments usually required to stabilize and control it.

Loss of periodontal support is noticeable by a horizontal bone-loss pattern (see Fig 1) that affects the interproximal area of the teeth. When periodontal support is lost, it becomes easier for the affected teeth to shift buccally, creating diastemas (black triangles) to appear between the teeth. Furthermore, soft tissue that surrounds the teeth migrates apically, leaving part of the root exposed. Therefore, teeth appear longer, and the presence of spaces between them becomes evident. This situation causes two problems: difficult periodontal maintenance and an unesthetic situation for the patient.

A wide range of treatments exists to enhance the esthetic zone. The positional alterations and impairment of the surrounding root tissues are the areas that are complex to control in esthetic rehabilitations; the simpler elements are aspects such as teeth shape and color.

Once periodontal disease has been stabilized, the positional deficiency of problematic teeth can be solved with orthodontic treatment, which leads to a more advantageous position for future restorations. As soon as teeth have been moved into their ideal position, the restorative treatment can be selected.

In cases like this, porcelain veneers are recommended over full crowns, which

require an aggressive preparation at the root area where the tooth diameter is narrower. This results in a larger amount of dental tissue destruction. Composite resins could also be used. Although this option is less aggressive than both veneers and crowns, its disadvantage compared to porcelain veneers is that these teeth require a larger amount of shape changes and are located in areas that are difficult to work in. Also, long-term maintenance of composite resins makes the final esthetic long-term result less predictable.

Porcelain veneers are a good treatment choice due to their long-term esthetic stability compared to composite resins. Also, as has been mentioned, they are less aggressive in terms of tooth preparation when compared to full-crown restorations. However, it is important to consider that even when preparations are minor they can still pose a problem when working on periodontal teeth, where part of the root is exposed. The preparations in these cases will occur closer to the root canal due to a much smaller diameter of the root in comparison to the anatomical crown. This proximity to the root canal can create a greater sensitivity, often necessitating the need for endodontic treatment.

To eliminate the presence of black triangles with porcelain veneers, the prosthodontist should consider, firstly, a very palatal preparation to give the laboratory technician enough space to close the diastema in a natural way, and secondly, a very subgingival execution of the preparation. Therefore, treating these patients only with porcelain veneers would be an aggressive treatment option.



**Fig 1** Preoperative views: initial smile, radiographs, and periodontal chart.

In order to transform this aggressive option into a more conservative one, a prior modification of the shape of these teeth should be carried out. This can be done with composite resins, where contours are shaped to suppress the interproximal soft tissue and to give a normal appearance to the papillae.

For all of the aforementioned reasons, selecting the best treatment in such cases can be complex. The option proposed in this case report is to combine composite resins and porcelain veneers so as to take advantage of the benefits and minimize the adverse effects of both techniques.

## Case study

A 48-year-old patient was referred from a periodontist with stabilized periodontal disease (Fig 1). The patient presented with chronic periodontitis 10 years previously, and was treated and stabilized using periodontal scaling. During her treatment, she experienced increased sensitivity in her left central incisor, which was solved by performing root canal treatment. She attended 6-monthly follow-up appointments to control her periodontal status. She later decided to have her ill-positioned teeth treated with orthodontics to improve her occlusion,



**Fig 2** Orthodontic treatment.



**Fig 3** Initial situation.



**Fig 4** Lateral views: initial situation.



thereby also improving the prognosis for periodontal maintenance and enhancing the appearance of the esthetic zone of her mouth.

Once the orthodontic treatment was completed, the planning of the restorative treatment began (Figs 2 and 3). To do this, impressions were taken and a wax-up was made from the plaster model. In this wax-up, the diastemas were to be closed by changing the mesiodistal size of the four incisors (Figs 4 and 5).

A silicone index was taken from the wax-up to do a mock-up on the patient with acrylic. This is a simple and quick

technique that allows both the clinician to visualize the changes made and the patient to give input into the esthetic appearance (Fig 6). This is important because, regardless of the technical approach taken, esthetic treatments involve a subjective variable that requires clinicians to work with their patients right from the planning stage in order to achieve the best final outcome.<sup>19,20</sup>

With the mock-up, it is possible to visualize the new size of the incisors and the way in which the gaps between the patient's teeth will be closed. During this mock-up evaluation it was noted that the



**Fig 5** Diagnostic wax-up.



**Fig 6** Mock-up.



**Fig 7** Lateral view: mock-up.



**Fig 8** Patient's smile with the mock-up.

maxillary left canine also needed to be treated to obtain optimal esthetic proportions (Fig 7). The overall changes to the smile were approved by the patient, who agreed for the work to continue and for the final treatment plan to be completed (Fig 8).

Once the patient's permission is given to begin the treatment, it should theoretically be simple; the definite restorations are copied from the mock-up and transformed into the final restorations.<sup>1</sup> Nevertheless, the problem is that this apparently quick and simple initial test gives the patient an easy solution,

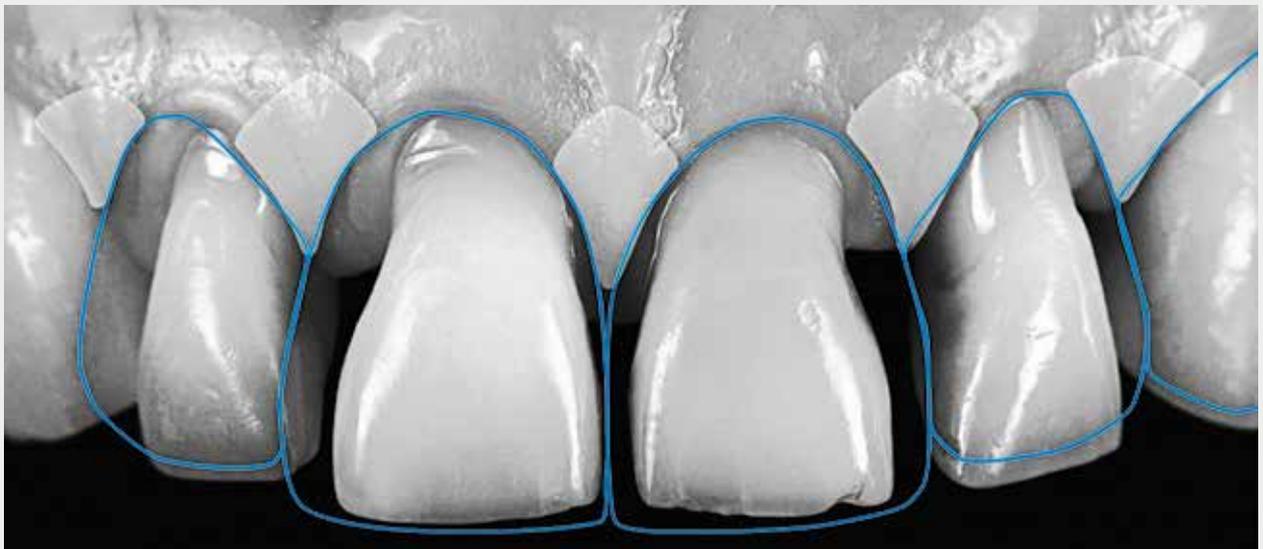
yet sometimes this solution cannot be achieved with the final restorations.

The changes from the initial situation (see Fig 3) to the mock-up (see Fig 8) are apparent and were much appreciated by the patient. Yet, comparing the final restorations with the initial situation (Fig 9) demonstrates how difficult it is to achieve the desired outcome with porcelain veneers.

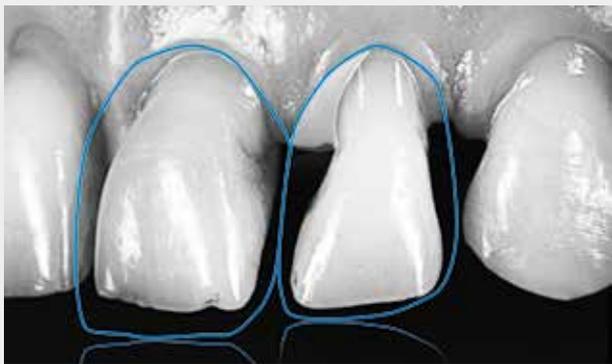
When the mock-up has been done, the acrylic is superimposed on the soft tissue. This is impossible to do with porcelain veneers. All that excess interproximal soft tissue should be suppressed



**Fig 9** Mock-up compared to initial situation.



**Fig 10** Diagram showing what changes need to be made to the hard and soft tissue.



**Fig 11** Diagram showing the amount of soft tissue that would need to be modified.

by the definitive restorations, which is a very complicated procedure for both the laboratory technician and the clinician.

Even if it is decided to continue with the treatment, another problem that presents itself is how to modify the interproximal soft tissue. Space is needed in order to remodel the tissue, which entails a more aggressive preparation.

In Fig 10, a diagram of the maxillary left side can be seen, showing all the tissue that would need to be changed.



**Fig 12** Cervical modification with a precontoured matrix.



**Fig 13** Precontoured matrix adapted to the cervical area.



**Fig 14** Application of composite resin.



**Fig 15** Final composite restoration: cervical area.

This procedure would require a very subgingival and palatal preparation in a narrow root area, which can drastically reduce the mechanical strength of the teeth. Moreover, root canal treatment would almost certainly be necessary to desensitize the teeth.

## The hybrid technique

Combining the techniques for composite resins and porcelain veneers means the clinician benefits from the advantages of both.<sup>8-10</sup> A composite resin is

used to reinforce the cervical area of the teeth (Fig 11) with the use of modified sectorial matrices that are adapted to the diameter of the root, making it possible to work subgingivally and thereby suppress the interproximal tissue. This way, when the tooth preparation is being performed, the most delicate area of the tooth has greater volume (Figs 12 to 15). This technique gives the clinician greater control over the extent to which the delicate tissue is pressured. Moreover, the stability and integration of this delicate tissue can be evaluated in follow-up appointments.



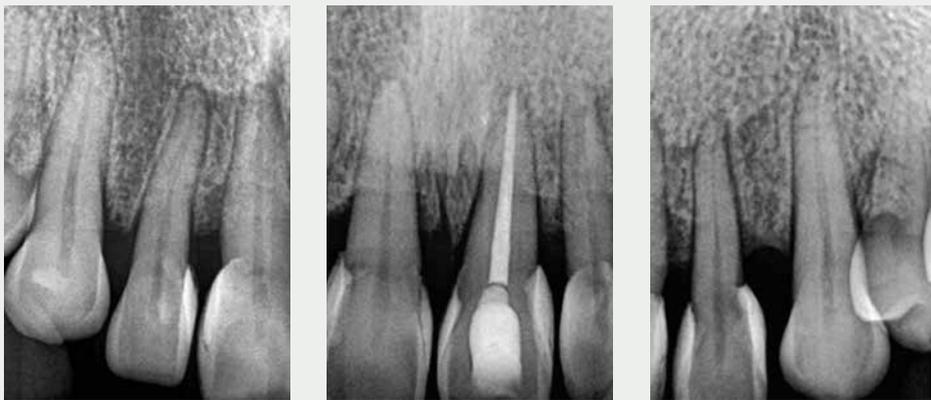
**Fig 16** Form modification done tooth by tooth.



**Fig 17** Soft tissue evaluation 2 weeks after the direct composite restoration.



**Fig 18** Lateral view: final soft tissue modification.



**Fig 19** Radiograph after composite restoration.



**Fig 20** Initial situation and teeth preparation after composite restorations.



**Fig 21** Teeth with composite restoration and final veneer preparation.



**Fig 22** Frontal view: final porcelain restorations.



**Fig 23** (a) Baseline, (b) final treatment, (c) 18 months after treatment.

Modifications are made piece by piece for both mesial and distal, until the papillae area is as it was planned in the mock-up (Figs 16 to 18). After a few days, the tissue is checked for stability, and the preparation of porcelain veneers can begin (Fig 19). The usual technique will be used but it will be less aggressive because subgingival preparations are not necessary, and part of the preparations will be on the enamel and other composite resins (Fig 20).

The preparation of the gingival margin for the restoration, as well as the buccal surface and the interproximal areas, is executed with a diamond bur.<sup>14</sup> The surface is then polished with another diamond bur and with polishing rubber. Special attention is given to creating smooth contours and sharp finish lines. Veneers are fabricated with a refractory dye technique and luted according to classic principles: porcelain etching, cleaning, silane, enamel



etching, adhesive resin, and composite resin as a luting cement (Fig 21).<sup>15,16</sup>

Finally, an optimal outcome is achieved, as well as the proper adaptation of the interproximal soft tissue (Figs 22 and 23).

## Conclusion

Periodontal teeth have lost periodontal support and are very sensitive due to their exposed roots. This results in patients wanting to esthetically improve this situation, especially in the esthetic zone. For teeth that are thus affected, the hybrid technique has several advantages. The main advantage is the preservation of tooth structure, which is essential when working with cervical areas that are so narrow. Therefore, by using restorative composite resin, clinicians

can apply pressure to the soft tissue in a controlled way and avoid aggressive, interproximal veneer preparations.<sup>12,13,16</sup> On the other hand, on the buccal area, the use of porcelain veneers can help to achieve long-term esthetic stability.<sup>18</sup> Furthermore, the hybrid technique is a reversible treatment as it offers the possibility of future treatment using conventional veneers and the preparation of the interproximal area.

The hybrid technique also has its disadvantages, which include the technical difficulty of porcelain veneers, communication with the laboratory technician, and the behavior of composite resins in such a delicate area. It is therefore essential to first carry out an exhaustive analysis. The hybrid technique requires further evaluation in future to assess whether its advantages outweigh its disadvantages.

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