SMILE REHABILITATION

— *A direct therapeutic approach assisted by digital diagnosis and mock-up*

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A successful rehabilitation in the esthetic zone depends on criteria that are well-known today, and the use of a direct technique is not an exception to the rule. On the contrary, a general approach without preparation—or at least an ultraconservative approach (reshaping the enamel or preparing a cavosurface bevel if necessary)—might even add a hint of additional complexity. As a reminder, the most important parameters that must be considered are the following:

- the integration of the shape (teeth in relation to the smile and the face) and implicitly its impact on function;
- the shade in the broad sense (in relation to the tissue and the adjacent teeth), encompassing mainly the color, the luminosity/translucency, the chroma, the opalescence and the fluorescence;
- the surface micromorphology and the luster of the restorative material; and
- the biological, functional and esthetic continuity of the restorations.

When considering a rehabilitation in young patients, who often need professional dental care from their teenage years, the direct technique is most frequently required because of the anatomical and functional immaturity of the dental arches. The procedure should include the use of a material or technique that will make possible the necessary adjustments and modifications resulting from the ongoing bio-functional dental development of the patient. Among the criteria to be considered when selecting the composite system, the material strength and its ease of use should be prioritized in order to achieve an optimal esthetic result. The layering technique must therefore be effective and simple; in other words, it is futile to perform complicated multilayering methods in the daily practice and there is a definite advantage to using products that are based on the Natural Layering Concept (e.g., inspiro, Edelweiss DR; Miris, Coltène/Whaledent; Essentia, GC; Enamel HRi, Micerium). This article will highlight the advantages of this technique that, as its name suggests, makes use of the anatomical characteristics of the natural tooth (contour, volume and thickness of the dentin and enamel). This significantly simplifies the clinician's work, provided it is associated with functional and esthetic planning tools, as described next.

Once the choice of therapeutic approach and restorative system has been confirmed, it is very important to develop a comprehensive esthetic and functional plan in order to improve the communication with the patient and to help the dentist to elaborate his or her restorative and layering techniques if needed. Nowadays, simplified approaches are available, compared with the conventional wax-up and hand-fabricated acrylic mock-ups; indeed, digital imaging and even programming tools of numerous CAD/CAM systems (e.g., CEREC, Dentsply Sirona) offer innovative solutions, also outlined in this article.[1, 2]

A successful treatment, especially an esthetic treatment, relies on the implementation of a standardized therapeutic approach and clinical protocol, including ideally any development aiming to make them more reliable and simpler. The esthetic treatment plan using software tools (general software, dental software or a CAD/CAM system) has made a comeback and its use has become more prevalent, and is likely to remain so.[1, 2] Besides a legitimate concern of simplification and cost-effectiveness, the thrust of this approach is to contextualize and allow the preview of the treatment during planning, before any procedure has been performed in the mouth. The advantage is twofold, both in terms of communication and prior acceptance of the result by the patient. Of course, sensitive situations with patients who had expected a result that is impossible to achieve with the therapeutic means at the clinician's disposal should be avoided.

With regard to the choice of restorative material, while also attempting to meet the multiple requirements related to the dental biomechanics, function and the esthetic aspects, the decision criteria should be redefined in light of the latest developments in composites and their longevity properties. A comprehensive perspective encompassing the long-term outcome of the tooth and its restoration should be explained to the patient in order to assist him or her in determining the most appropriate choice. Very often, the best way is to sacrifice the weakest tissue. Today, a basic approach involving the use of direct composite resins in addition to whitening and microabrasion would therefore be a sensible approach for young patients in need of esthetic treatment, as highlighted in this article. In this area, a concept embracing both the shade and the layering has gradually established itself as the most effective solution.

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

Fig. 1

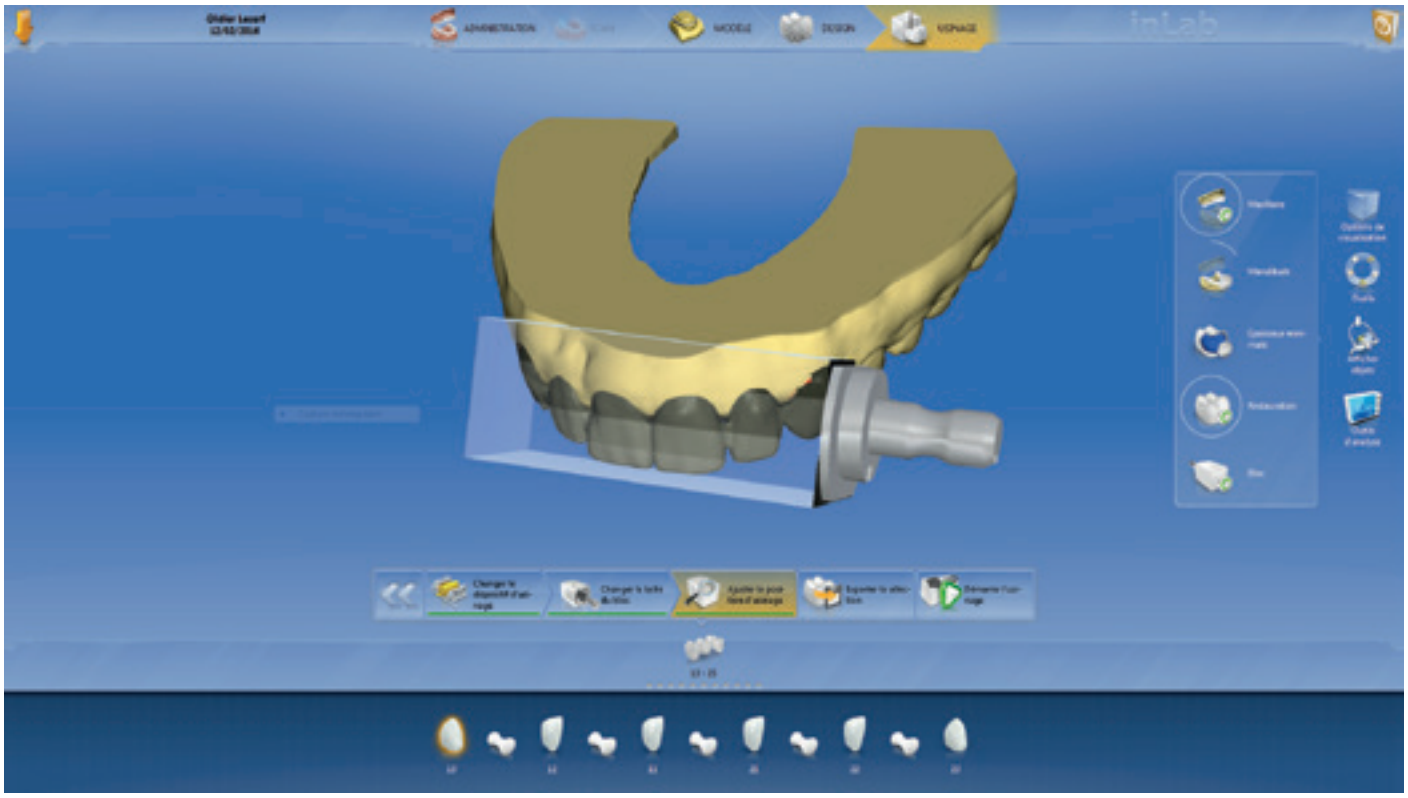

Fig. 2

Fig. 3

Fig. 1
Pre-op view of a young patient (14 years old) with hypoplasia of all of her anterior teeth (canine to canine, both jaws).

Figs. 2 & 3
A mock-up was designed with the CEREC system, using the veneer program. The trial shows the improvement in terms of form and overall smile design.

Fig. 4
A specific and innovative bilaminar shade guide for the clinical application of the Natural Layering Concept (i.e., the inspiro system).

Fig. 4

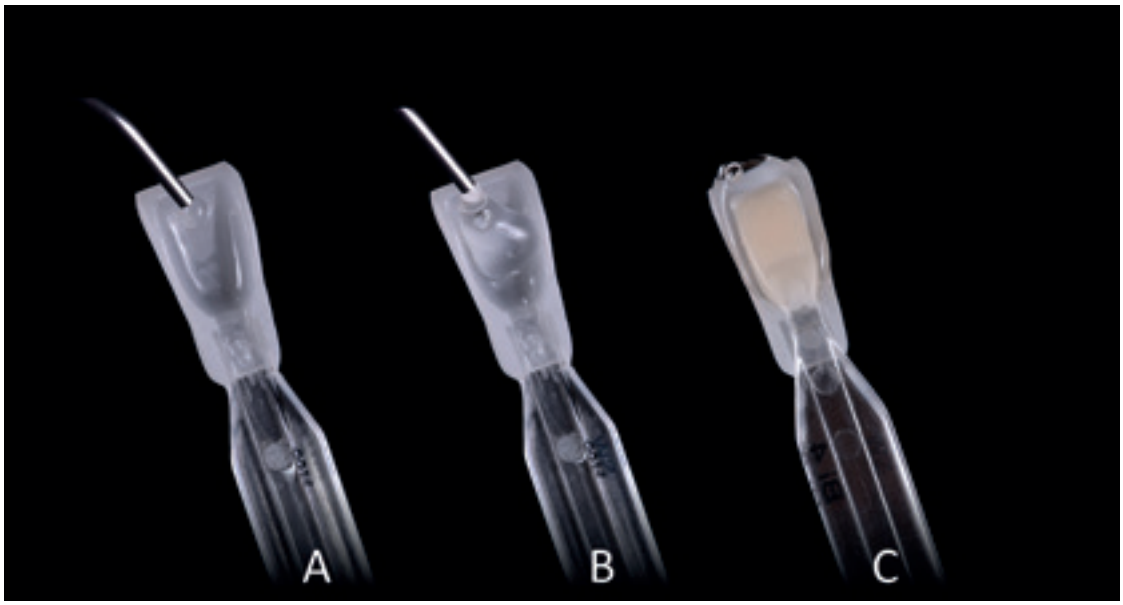

Fig. 5
The shade selection consists of two steps, namely the selection of the dentin and enamel shades with two separate samples, which are then to be combined with a drop of glycerin gel between them to favor good light transmission through the assemblage.

Fig. 5

Fig. 6
The combined samples are then applied edge to edge to check color match. Here, dentin shade Body i1 and enamel shade Skin Bleach were selected (inspiro).

Fig. 6

Fig. 7

Figs. 7 & 8
The silicone index made from the mock-up is used to place a very thin layer of flowable composite (Skin Bleach) to serve as a matrix for the layers to follow.

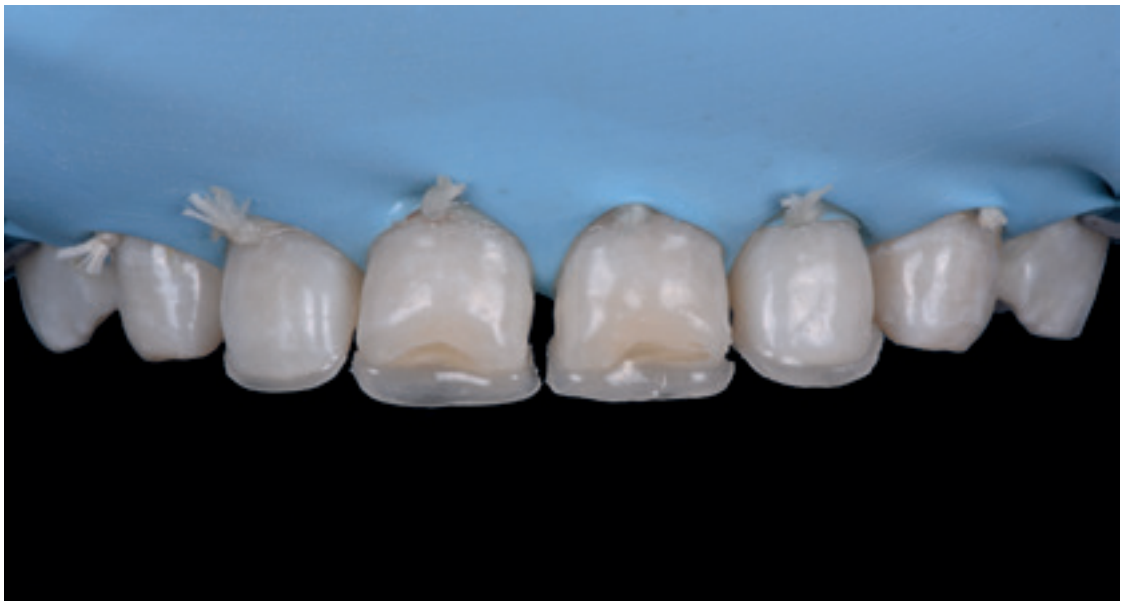

Fig. 8

Fig. 9

Fig. 9
Dentin is built over the facial natural enamel surfaces, which were not prepared at all in this case, taking advantage of the overall increase in tooth volume and dimension. Dentin is shaped as the natural dentin core, with lobes.

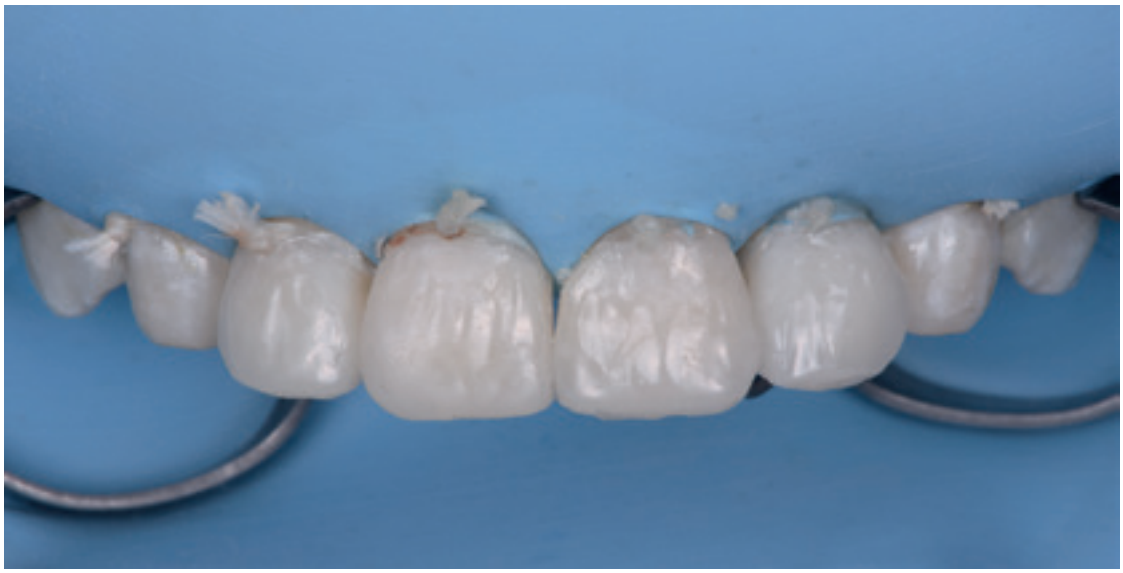

Fig. 10
A single enamel shade covers the dentin and finalizes teeth volume and form.

Fig. 10

Figs. 11 & 12
Intra-oral views of the no-preparation restorations placed with the Natural Layering Concept, showing the significant potential of direct techniques to enhance natural or post-orthodontic smiles in young patients or anyone seeking optimal tissue conservation.

Fig. 11

Fig. 12