

'No-prep' adhesive restorations: dealing with aesthetic deficiencies

Didier Dietschi presents the indications and advantages of the concept of natural stratification in a young smile

The use of ceramics in the form of veneers or crowns was for a long time considered the only satisfactory and durable solution to the aesthetic deficiencies of the smile, in young as well as adult patients. This hegemony of ceramics, which tends to linger, is favoured by the dental industry that invests significant amounts of money to promote its materials and new technologies, without always showing a lot of consideration for the biomechanics of the healthy tooth.

The sheer aesthetic criteria must therefore be weighed against the biological and mechanical fundamental principles of the natural tooth in order to ensure the longevity of the restorations on the one hand, and preserve the vitality and the integrity of the dental organ on the other. Thus, these considerations have been encouraging dentists for a long time to consider direct bonding techniques as a first choice alternative for the treatment of aesthetics deficiencies in a young smile, especially (and generally) every time the extent of the defects allows it (Macedo, Raj and Ritter, 2006; Peumans et al, 1997; Dietschi, Ardu and Krejci, 2006; Magne and So, 2008; Dietschi, 2008).

According to studies, the improvement of the aesthetic properties of restorative composite materials based on the model of the natural tooth (Magne and So, 2008; Dietschi, 2008; Cook and McAre, 1985; Dietschi, Ardu and Krejci, 2000; Ubassy, 1993) also make

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Education aims and objectives

This article aims to demonstrate two clinical cases that illustrate the direct therapeutic approach and the aesthetic potential of composite systems based on the concept of natural stratification.

Expected outcomes

Correctly answering the questions on page xx, worth one hour of verifiable CPD, will demonstrate that the reader understands the indications and advantages of the concept of natural stratification, leading to reliable and highly aesthetic results.



Figures 1-4: Pre-operative extra- and intraoral views of a young patient showing bilateral diastemas, complicated by a mild fluorosis

direct restorations available to everyone, since they are no longer the prerogative of gifted clinicians trained to complex stratification techniques, inaccessible to the general practitioner.

Indeed, several systems have been developed during the past 10 years that have been building on the concept of natural stratification, consisting of only two basic layers (dentine and enamel) and an appropriate shade guide. The clinical protocols logically followed a simplification and an increase in reliability, which bodes well for our profession (always under economic pressure). Moreover, clinical results in the medium and long term about the use of direct composite as an aesthetic correction material proved to be reliable

(Dietschi, 1995; 1997; 2001). The goal of this article is to present two clinical cases that illustrate the direct therapeutic approach and the aesthetic potential of composite systems based on the concept of natural stratification.

Clinical cases

Case one – diastema closure

This first case presents a simple application of direct bonding for diastema closure in a young patient also showing a dark dentine shade, as well as a mild fluorosis especially visible on incisal edges and canine tips (Figure 1). Given the age of the patient (15 years old), it was decided not to treat the fluorosis, which would have likely made whitening necessary, but also critical in view of the risks of sensitivity

(Figures 1-4).

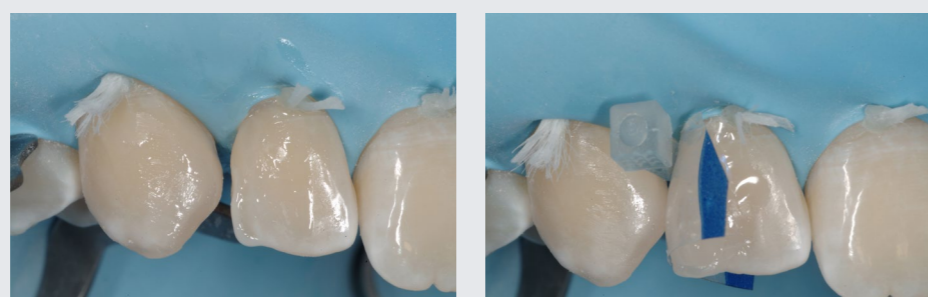
The treatment was carried out under rubber dam to ensure the quality of the bonding in the proximal areas, juxtagingival and also for safety and work comfort. The enamel surfaces were only prepared by sandblasting (aluminum oxide 25µm) before phosphoric acid etching (H3PO4 35-37%) for 45-60 seconds, given the fluorosis. The bonding procedure was carried out with a multi-component system (Optibond FL, Kerr) before the direct application of the composite in two layers → plus the application of an effect shade (Inspiro System, Edelweiss DR).

The stratification started with a layer of dentine (Body i3) on the distal surfaces of the upper lateral incisors and on the mesial face of the right canine. A semi-opaque white effect shade (ice) applied on the dentine layer meant it could imitate the fluorosis stains in order to improve the restoration mimicry (Figures 5 a and 5b). A layer of enamel (skin white) helped complete the restorations and perfect their aesthetic integration.

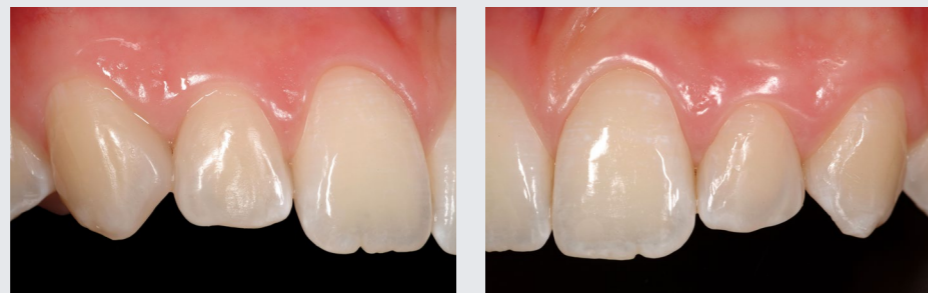
The concept of natural stratification was followed to carry out this treatment, based on a bilaminar application of the composite, the dentine and enamel shades, accurately imitating optical characteristics of the natural tissues (Figures 6 to 9).

Case two – extensive reconstitution of the smile

This second case presents a more extensive and complex application of direct bonding, but is nevertheless based on the same clinical



Figures 5a and 5b: A direct approach has naturally been followed in this case. The restorations include a dentine shade (Body i3), an effect shade (ice) and an enamel (skin white, Inspiro, Edelweiss DR)



Figures 6a and 6b: Final intraoral views showing the good integration of the restorations

protocol.

This case is about a 17-year-old patient showing a hypodontia of the four upper incisors, and a generalised mild to moderate fluorosis (type III, according to the Thylstrup-Fejerskov Index) (Figures 10 and 11).

A preliminary orthodontic consultation had led to the recommendation of an essentially restorative solution to this problem. In addition, the relative complexity of this case suggested the preparation of a diagnostic wax-up and a guided intraoral mock-up, in order

to confirm the therapeutic choice and allow an aesthetic preview (Figures 12 and 13).

The treatment was also realised under a rubber dam, using mainly interdental matrix, a silicone key and a caliper for the control of the new dimensions and dental proportions; (Figures 14 and 15). The reconstitutions were carried out by applying three shades, like the previous case (dentine: Body i2; effect shade: azur; enamel: skin white of the Inspiro System) (Figures 16 and 17). The treatment was performed over two clinical sessions for

comfort reasons. Figures 18 and 19 summarise the positive aesthetic impact of the treatment, and Figure 20 shows the stability of the result two years later.

The difference between the two cases illustrating the versatility of bonding lies essentially in the diagnostic phase, more thorough for the second treatment.

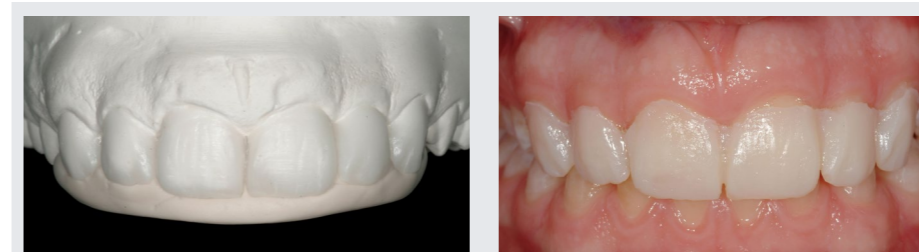
Reliable and aesthetic results

The use of direct composites has become unavoidable in aesthetic dentistry in almost every treatment of a young smile and during aesthetic transformations of no or little restored teeth.

This is a very positive evolution of conservative dentistry, supported by the aesthetic improvement of the materials and the simplification of clinical protocols.



Figure 20: After two years



Figures 12 and 13: Wax-up and intraoral resin model according to the wax-up used to confirm the aesthetic and functional configuration planned on models



Figures 14 and 15: Intraoperative views and restorative procedures under a rubber dam in order to control the quality of the bonding and its longevity. View of the proximal dentine set-up on the UR2



Figures 16 and 17: View at the end of the first session showing the new anatomy of the four incisors transformed by direct technique (dentine Body i2; effect shade 'azur'; and enamel 'skin white', Inspiro, Edelweiss DR)



Figures 18 and 19: Final extra- and intraoral views. The direct approach, without reparation, represents an unequalled therapeutic advance for the aesthetic treatment of young patients and of the smile, without any other form of pathology



Figures 7-9: General views summing up the therapeutic approach and the clinical procedures carried out under a rubber dam. The aesthetic integration is facilitated by the application of a concept of bilaminar stratification, easy to implement and predictable; ideal for the treatment of aesthetic deficiencies of the young smile



Figures 10 and 11: Pre-operative extra- and intraoral views of a young patient showing a hypoplasia of anterior teeth

'The use of direct composites has become unavoidable in aesthetic dentistry in almost every treatment of a young smile and during aesthetic transformations of no or little restored teeth'

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The author declares having taken part in the development of the product used to carry out the two cases presented in this article, but hasn't received any fees or royalties for this work.