Clinical

Bio-esthetics and function in harmony

Stephan Lampl¹

Composite resins nowadays occupy a paramount position among restorative materials because they offer excellent esthetic potential and acceptable longevity with a significantly lower cost than equivalent ceramic restorations for the treatment of both anterior and posterior teeth. In addition, composite restorations allow for minimally invasive preparations - or no preparation at all - when replacing decayed or missing tissue. This approach is part of a new concept termed bio-esthetics that gives priority to nonrestorative or additive procedures, such as bleaching, micro-abrasion, enamel recontouring, direct composite resins, bonded bridges, and implants, in the case of missing dental units or cases that are more complex. These many procedures definitely merit further attention because they offer tremendous improvements in practicability, efficiency and predictability. Altogether, bio-esthetics undoubtedly

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takes esthetic and restorative dentistry to a new level; one that can be described as comprehensive and conservative smile design.

For quite some time, the creation of perfect direct restorations has been an elusive goal because of the imperfect optical properties of composite resins and perfectible clinical procedures. The attempt to mimic the shades and layering techniques developed for ceramic restorations led to complicated application methods, controllable only by highly skilled practitioners. For years, this has limited the number of patients who could benefit from the tremendous advantage of free-hand bonding. The use of the natural tooth as a model and the identification of respective dentine and enamel optical characteristics (tritimulus L*a*b* color measurements and contrast ratio) have been essential in developing better direct tooth-colored materials.

Numerous composite systems exist in the marketplace, in which highly esthetic results can be achieved using the socalled "Free Hand" layering technique. In everyday practice however, only a few dentists are able to achieve perfect results in a timely and efficient manner using this technique. This will change with the use of the edelweiss Veneer &

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Occlusion System (Ultradent Products, Inc, Utah, USA). The aim of this article is to familiarize the practitioner with the features and clinical aspects of this new system and technique.

Edelweiss Veneers & Occlusions are state of the art for a modern and minimally invasive approach towards the creation of highly esthetic anterior and posterior restorations.

For the first time in the history of dentistry, it is now possible to work with prefabricated veneers and occlusions made from homogeneous nano-hybrid composite using modern laser technology. It is now feasible to directly create the natural shape and youthful luminance of a tooth so easily and perfectly in only one appointment.

Edelweiss Veneers & Occlusions are polymerized,

Case 1: edelweiss Veneers







Non prep preop situation



Bonding Peak Universal



Before



Etching



Adjusted & filled Veneer

prefabricated, laser-sintered and -vitrified, radiopaque, highly-filled homogenous nano-hybrid composite enamel shells with an inorganic surface. and body. The facially and occlusally anatomical thin shells represent the anatomic foundations for single and multiple anterior and posterior teeth as well as for increasing the vertical dimension in the posterior region. Hence, a functioning anterior cusped guidance can also be obtained easier than ever before. Cementation is performed using Amelogen Plus (Ultradent



Application of Veneer

Products, Inc, Utah, USA) to create a stable monoblock restoration (between the dentin/enamel and restorative composite and edelweiss Veneer/Occlusion). Final reconstruction takes place quickly and effortlessly with functional and high quality esthetic results.

Sizing Concept

After studying all shape and size variations of natural tooth anatomy, edelweiss Veneers & Occlusions were developed in



Positioned Veneer



Spot curing Velo



Finishing of incisal edges



After

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After

Case 2: edelweiss OcclusionVD



Figure 1: Before After Veneer and OcclusionVD.







Figure 3: Michigan splint relaxed position.



Figure 4: Articulated michigan splint.



Figure 5: Model with customized edelweiss occlusions.



Figure 6: Etching.

one universal, prefabricated, contourable shape, available in different sizes for both the upper and lower arch to provide an optimal anatomical basis for single units or complete reconstruction in the anterior and posterior region. Due to the natural morphology, the pre-fabricated Occlusions are very easy to incorporate into an existing occlusion. A total of 54 different sizes (10 each small, medium, large per Veneer and 8 each small, medium, large per Occlusion) are available for the anterior and posterior upper arch; and 44 sizes are available for the anterior and posterior lower arch (10 each small, medium per Veneer and each small, medium, large per Occlusion).

Laser Sintered and Vitrified Process

Based on injection moulding technology, high pressure (100 bar) is applied to condense the glass fillers before light and thermal polymerization of the Veneer & Occlusion blanks takes place.

The laser treated process combines the best of two worlds: a homogenous, inorganic, and high gloss laser vitrified surface fused together with a sintered and thermallytempered (300^c) dynamic composite core produces an optimal integration between function and esthetics. This unique manufacturing technology was developed in conjunction with Prof. Didier Dietschi at the University of Geneva. The difference lies in its similarity to nature.

Shading Concept

The use of the natural tooth as a model was a logical development of direct restorative materials that led to the simplified shading and layering concept, the Natural Layering Technique. It is based on the identification of true dentine and enamel optical characteristics using tritimulus L*a*b* color and contrast ratio.

The edelweiss Veneer & Occlusion System restructures teeth using two toothlike masses that are comparable to





Figure 8: Light curing.



Figure 9: OcclusionVD.



Figure 10: Application of composite.





Figure 11: Positioning and removal of surplus Figure Territorial.

Figure 12: Light curing.

dentin and enamel to create restorations with natural looking results. Amelogen Plus Dentin, available in 4 shades (A1, A2, A3, A 3.5) was developed in a single opacity and the same hue with different chroma levels and fluorescence. From Amelogen Plus Dentin A0/SL, for the restoration of bleached teeth, to A 3.5 for cervical restorations of darker teeth for elderly patients. One universal Amelogen Plus Enamel translucency shade EN, with the true opalescence for all optical variations found in natural dentition.

Using the Amelogen Plus Dentin and Enamel Shade Guide, each combination of dentine and the universal enamel shade can be evaluated and compared to reference teeth, so that the risk of incorrect shade selection and esthetic outcome is minimized. The quality of the final restoration depends upon the correct shade evaluation. Selection of the dentine Shade Guide takes place in the cervical area, where the enamel is the thinnest. Selection of the Dentin and Enamel tint and translucency is performed in the incisal area using the Dentin and Enamel Shade Guide. The Dentin cores are layered inside the universal Enamel shell to determine the optimal shade.

The prefabricated edelweiss Veneer & Occlusion shells are only available in the universal Enamel shade, since they are cemented using the dentine shades selected above. For substrates that are severely broken down or discolored, a dentin shade is recommended to provide a homogenous shade. For shaping or simple shade corrections, the universal





Figure 13: Finishing interdental area.

Figure 14: Margin adaptation.



Figure 15: Relaxed bite position in vertical dimension.



Figure 16: Front view.

Figure 17: Reoccludation.



Figure 18: Proof of functional movements.

enamel shade can be used (EN). Note, however, that too much enamel can make the restoration gray and too transparent.

A new range of indications

Aside from direct veneering of single or multiple unit anterior and posterior restorations, several other classical indications, such as Class III, IV and V cavities and other esthetic or functional problems can be addressed via direct composite restorations using Amelogen Plus.

- Caries
- Old restorations
- Lengthening of the incisal edge
- Misaligned teeth
- Tooth fractures

- Tooth discoloration
- Incorrect chromaticity
- Anatomical deformities
- Diastemas
- Attrition
- Abrasion
- Erosion
- Lifting the vertical dimension (CMD)
- •Crown facing
- Cosmetic corrections

Conclusion

Traditional restorative objectives have not changed over time; rather, the implementation of restoratives has been based on the esthetic demands of an increasing number of



Figure 19: Occlusal Postop.

Figure 20: Upper veneer placement.



Figure 21: Finishing incisal edges.



Figure 22: Postop.



Figure 23: Postop in final occlusion.

patients. Composite resins, which require a strictly conservative approach, have thus become the materials of choice for young patients rather than ceramics, where the option of repairs at a later stage may be preferable, as well



Figure 24: Postop side view.

as being a more economical proposition for the clinician, and therefore the patient, compared to ceramics. The contemporary practitioner is ultimately challenged to replace the missing tissue or eventually modify its configuration by applying artificial material to the patient's teeth, which has to simulate the appearance of natural tissue. The edelweiss Veneer & Occlusion System has enabled this objective to be achieved in a predictable manner, by incorporating newly acquired knowledge about natural tissue optical properties into contemporary composite systems. The system's versatile area of application combined with its time and cost saving procedure make the edelweiss Veneer & Occlusion System a sound investment for the future. This advance can be regarded as a milestone in operative dentistry, as it will contribute tremendously to direct composite application, helping a larger number of our patients to receive esthetic restorations that are more conservative and affordable.

Disclosure: Dr Stephan Lampl is the CEO and founder Edelweiss Dentistry, developer of the edelweiss Veneer & Occlusion System



Figure 25: Tensed smile before.



Figure 26: Relaxed smile after.