When esthetics matter

The use of new materials in dental esthetics

By Stefen Koubi, France and Hilal Kuday, Turkey

One of the major issues leading to unsatisfactory results in fabricating several ceramic restorations in the anterior region is shade integration. Commonly, patients have a combination of discolored prepared teeth, metal constructions and teeth showing no discolouration. Achieving a harmonious overall appearance in these situations is a challenge.

Currently, the use of glass-ceramic materials, such as lithium disilicate (Ivoclar Vivadent), is the textbook approach in terms of esthetic integration. These materials offer the possibility of creating unique translucent restorations that mimic dental enamel.

A wide array of possibilities for cementation also facilitates the creation of lifelike results.

In the past, severe discoloration was often a reason that glass ceramics could not be used to fabricate restorations. The continual improvement of the materials, however, has led to the development of comprehensive systems such as IPS e.max.

This system offers the advantages of press ceramics, including accuracy of fit and esthetics, while eliminating previous drawbacks, such as restricted use on dark preparations. That we have glass ceramics in various levels of opacity and translucency at our disposal opens up a whole range of new possibilities.

We can now cover the entire spectrum of single-tooth and small bridge restorations with glass ceramics, regardless of the underlining tooth structure. Discolored teeth or metal structures are also no longer reasons for avoiding lithium disilicate glass ceramics.

The use of frameworks and restorations in different levels of translucency is illustrated here by means of a multidisciplinary case study.

The objective in this case was to re-create the esthetics of the patient’s anterior teeth on a natural tooth and a metal core buildup.

The patient expressed the wish to improve the appearance of his anterior teeth.

Clear communication between the dentist, patient and laboratory was essential to ensuring that both the clinician and laboratory had the same information regarding the preparation.

The initial examination revealed that the periodontal tissue was inflamed and in generally poor condition (Figs. 1a, 2).

Creating unique translucent restorations that mimic dental enamel

Outreach program provides free oral health services to the underserved

Heraeus Kulzer recently hosted and coordinated an outreach program in collaboration with The L.D. Pankey Foundation to provide free oral health services to those without access to dental care. The two-day clinic, called Pankey Dental Access Days, was held at Heraeus’ Education Facility, located on the Heraeus campus in Indiana.

“This event is an opportunity to reach out to our community and to help provide services to those who need them most,” said Chris Holden, president of Heraeus. “We recognize that a two-day clinic does not solve the larger issue of health care access, but it can certainly bring attention to the tremendous need for oral health care, both in our community and across the U.S.”

Pankey Dental Access Days is dedicated to providing free oral health services to underserved people across the United States. The event is largely dependent on local volunteers, including dentists, hygienists, assistants and others who believe in providing oral health care to those in need.

Dr. Keith Phillips and John Lane of the Pankey Foundation in Florida work on a set of dentures during the recent Pankey Dental Access Days, hosted at Heraeus Corporate Headquarters in South Bend, Ind. (Photo provided by Heraeus)

The mission of each local two-day clinic is to provide as much care to as many people as possible. In keeping with this goal, approximately 100 patients were given dental care at the South Bend event, which was held Aug. 13 and 14. Most received a mix of services, including cancer screenings, hygiene/cleanings, fillings, extractions, root canals and crowns.

The L.D. Pankey Foundation’s Dental Access Days is operated through a cooperative effort of individual Pankey-trained dental professionals and dental companies that provide support through monetary and in-kind product and service donations.

Heraeus Kulzer, whose North American manufacturing plant is based in South Bend, is donating many of its flagship products to the effort, including Venus, Venus Diamond, Gluma and iBond.

“Heraeus is honored to be part of Dental Access Days,” Holden said. “We are truly inspired by the work of the L.D. Pankey Foundation and its passion and commitment to help people in need.”
After the initial treatment, the condition of the periodontal tissue had improved enough to allow the restorative procedure to be conducted with adhesive cementation.

An analysis of the situation presented by the patient from an aesthetic point of view revealed that older ceramic restorations and numerous composite root canal posts created an inharmonious appearance.

An esthetic concept based on the existing tooth shapes was developed to help preserve the individual facial characteristics of the patient. Subsequently, the necessary preparations were carried out (Figs. 3, 4).

IPS e.max Press ceramic restorations, including veneers and crowns, were fabricated for the entire maxilla (Figs. 5–8). The IPS e.max Press frameworks were layered with one layering ceramic (IPS e.max Ceram), regardless of their translucency level, which yielded a balanced appearance.

The restoration design was dictated by the underlying tooth structure. For crowns that were placed on metal substrates, press ingots with a high opacity were used. In addition, the thickness of the restorations was increased in order to mask the metal color and achieve lifelike layering.

The veneers were considerably smaller, and low translucency ingots with a translucency higher than that of medium opacity or high opacity ingots were used. A thickness of approx. 0.5 mm was sufficient to allow the dentine...
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Restorations were cemented with Variolink (transparent; Ivoclar Vivadent), while using a rubber dam to ensure that every restoration was isolated (Fig. 9).

By using a versatile ceramic and cementation system and by imitating the light effects, lifelike restorations were fabricated in spite of the unfavorable initial situation (Figs. 13–15).

Particular attention was paid to the surface treatment and design of a macro- and micro-pattern in order to achieve natural-looking light effects (Fig. 12).

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Shade to shine through the translucent framework and thus create the desired chameleon effect.

A view of the pressed opaque and translucent frameworks illustrates the versatility of the IPS e.max system (Figs. 7, 8). The optical properties were harmonized by layering IPS e.max Ceram onto the pressed frameworks (Figs. 10, 11).

Particular attention was paid to the surface treatment and design of a macro- and micro-pattern in order to achieve natural-looking light effects (Fig. 12).

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Photos provided by Dr. Stefen Koubi and Hilal Kuday, CDT

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