When aesthetics matter

Dr Stefen Koubi, France, and Hilal Kuday, Turkey, about the use of new materials in dental aesthetics

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 discoloured 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 IPS e.max Press lithium disilicate (Ivoclar Vivadent), is the textbook approach in terms of aesthetic 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 discolouration 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 aesthetics, 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 underlying tooth structure. Discoloured 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 recreate the aesthetics of the patient’s anterior teeth on a natural tooth and a metal core build-up. The patient expressed the wish to improve the appearance of his anterior teeth. Clear communication between the dental practice and laboratory was essential to ensuring that both the clinician and laboratory had the same information regarding the preparations.

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 root canal posts created an inharmonious appearance. A thickness of approx. 0.5 mm was sufficient to allow the dentinal 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 harmonised by laying IPS e.max Ceram onto the pressed framework (Figs. 10 & 11).

An aesthetic 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 colour and achieve lifelike layering. The veneers were considerably smaller, and light- and translucent ingots with a translucency higher than that of medium opacity ingots were used. A thickness of approx. 0.5 mm was sufficient to allow the dentine 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 harmonised by laying 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). After try-in and adjustment, the 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 unfavourable initial situation (Figs. 13-15).