A methodical approach to all-ceramics

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The IPS e.max range of materials includes the nano-fluorapatite, glass-ceramic IPS e.max Ceram, which is a modern veneering ceramic suitable for use in conjunction with zirconium oxide and lithium disilicate frameworks. Along with IPS Empress, IPS e.max forms part of Ivoclar Vivadent’s portfolio of all-ceramic systems.

A 42-year-old male patient presented with the wish to have the gaps between his teeth corrected. The patient opted for an aesthetic makeover with all-ceramic bridges. Following thorough examination and preliminary periodontal treatment, the teeth were prepared and an impression was taken. Tooth shades were selected individually and documented with photographs. Digital photographs enabled the dental technician to evaluate and analyse the brightness value, saturation, and colour temperature of the tooth shade under specific conditions in the laboratory (Fig. 1).

After the models had been fabricated, they were mounted skull-related onto an articulator using a face-bow transfer system. As the abutments diverged, two bridges and two single-crown restorations were necessary: an eight-unit bridge, a six-unit bridge, and two single-unit crowns. Zirconium oxide (IPS e.max ZirCAD) was used as framework material.

The bridge frameworks were cut at the Fräszentrum Zfx-West (milling centre) by my colleague Udo Werner. The frameworks were designed in such a way that they supported the cusps, as this design contributes considerably to the longevity of the restoration. Although opinions vary widely on this issue, as a principle, I avoid additional grinding of frameworks, to prevent changes in the monoclinic phase, which may jeopardise the bonding capacity of the areas affected.

The bridges were seated on the models to check their fit. They were subsequently coated with IPS e.max Ceram Zirkon, and fired as recommended by the manufacturer. Now, the interesting part of the work could begin. In view of the infrequency of this case, I decided to complete the bridges in several steps.

As the first step after firing the liner, I applied a dentin wash layer using a dentin shade that matched the re...

Fig. 1

Fig. 2

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Fig. 10

Fig. 11

Fig. 12
After the dentin core was built up, a first cutback was performed and then the mamelon materials were applied (Fig. 4). To prevent the materials from dehydrating excessively, I first fired the first layering of dentin material (Fig. 5). For this purpose, I reduced the temperature increase to 35 °C to provide a slow heat build-up. This measure ensures a homogenous sintering of the ceramic material even in extensive restorations (Fig. 6). To gain a better understanding of the shape and attain a precise position of the gingival margins, I cast an unsectioned model using red plaster, and then mounted the model on the articulator.

Upon completion of the first dentin firing cycle, the incisal was layered using various incisal materials and fired (Figs. 7, 8). Additional small adjustments were applied using the incisal materials, IPS e.max Ceram Opal Effect OE1 and OE5, and subsequently fired.

The ceramic surfaces were finished using ceramically honed stones. Silver dust was applied to check and finish the surface-design (Fig. 9). Axially for the incisal step, glaze firing was carried out. Subsequently, the ceramic veneering was polished with pumice using a polishing lath. Figure 10 shows the completed restoration from the occlusal aspect.

Incorporating the final bridge with a glass-ionomer cement did not create any difficulties. Figure 11 shows the restoration after having been in situ for three weeks. Figure 12 shows an occlusal view of the restoration, and Figure 13 shows a close-up of the dental reconstruction.

In conclusion, IPS e.max Ceram provides a straightforward technique for creating aesthetically exacting dental replacements without ever giving users the feeling that they have reached the limits of the system. The natural shade effect has left a positive impression on both the user and patient, and everybody involved was satisfied with the result.

It is essential that all persons involved in the process collaborate closely with each other, to make results like this possible. In particular, I would like to thank dentist Dirk Conrad and his practice team in Remscheid, as well as the Fräszentrum Zfx West in Bad Neuenahr for the work performed.

Contact Info
S.-Jan Strahinovic undertook vocational education and training from 1987 to 1990. In 2002, he completed his Master’s examination at the Meisterschule in Münster in Germany. He publishes and lectures in the fields of ceramic restorations, aesthetics, and CAD/CAM. In addition, he is a certified PSK Dental-aestheticist (specialist in dental aesthetics).

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