For the creation of a bright smile, a precise evaluation of aesthetic and functional aspects of treatment is required. A well-planned working protocol is essential in the fabrication of dental restorations. We have developed a special approach in our dental laboratory that is presented here with the help of a case report.

The restorative work involved the fabrication of six veneers for the anterior teeth. In challenging cases, the dental laboratory technician begins the restorative procedure by carefully analysing all of the available data. This includes photographs of the initial situation, stannum and a face-mirror registration.

The facial photograph of the patient alone provides important and useful information. Based on this image, we can carefully analyse the tooth shape and the facial parameters (morphology) and gain significant insight into how to approach the creation of an “aesthetic smile” (Fig. 1). In our case, the intra-oral images showed that the anterior and posterior teeth had been severely abraded (Fig. 2). The patient asked for these flaws to be removed and for the natural shape of his teeth to be restored. After in-depth consultation with his dentist, it was decided to restore the affected teeth with all-ceramic veneers according to minimally invasive principles.

As a preliminary step, orthodontic treatment was performed to move teeth 11, 12, 15, 21, 22 and 25 towards the vestibular aspect and thus achieve a less traumatising function. Then the vestibular surfaces of the maxillary anterior teeth were then prepared (Fig. 3).

We choose to produce the veneers with pressed ceramic, which when done properly can build up according to the individual requirements. I first fabricate restorations (IPS Empress, Ivoclar Vivadent) in this way in 1992 and have been using this technique for many years.

IPS Empress 2 was my ceramic of choice but I now use IPS e.max Press (lithium disilicate-glass ceramic) exclusively for this purpose. In my opinion, this solution is ideal for fabricating restorations of this kind.

Although the conventional layering technique using refractory models produces highly aesthetical results, it is very time-consuming and demanding. The restoration has to be fired several times without the possibility of monitoring its colour in the process. With the technique I use, however, a framework is pressed and then the incisal third is cut back. Thereafter, the dental technician “naturally” has to apply the veneering ceramic. This procedure takes less time, and the outcome is easier to control.

The layering scheme
In anterior restorations in particular, it is important to match the colour saturation and the brightness carefully. In most cases, however, several ceramic layers are required to achieve the appropriate blend.

In the present minimally prepared case, very little space was available for the veneer. I guess that every dental technician is familiar with this scenario. In order to achieve a true-to-nature result nonetheless, a detailed layering scheme is indispensable (Fig. 4).

In this case, I used two different IPS e.max Ceram Dentin materials (Ivoclar Vivadent): A5 and A2, as well as a lighter Dentin B1 mixed with 1/2 Opal Effect 4 (OE 4) to increase the value. As we all know, the incisal third of natural teeth is translucent. Therefore, in this part of the restoration, the Dentin material has to be desaturated with a translucent neutral material, Opal Effect 1 (OE 1) material is indispensable owing to its opalescent properties. It has a translucent blue appearance in reflected light and an amber tint in transmitted light. Consequently, we placed some OE 1 in the proximal corners and along the incisal edges.

Natural teeth often have small areas on the edges that absorb light. In the present case, these areas were imitated with a violet material (Opal Effect violet) and 1/2 OE 1. I have given this mixture the descriptive name of “absorpt-ium material”. As only limited space was available for the enamel material, I decided to use the bright OE 4. The layering technique is explained in detail in my book Tricks and Hints.4

The IPS e.max Press ingots are ideal for fabricating the frameworks of layered veneers. In the present case, I used at least the composite Flo- rence Opal (Ivoclar Vivadent), this material, however, does not have the desired translucency, and I have given this mixture the descriptive name of “absorpt-ium material”. As only limited space was available for the enamel material, I decided to use the bright OE 4. The layering technique is explained in detail in my book Tricks and Hints.4
4. In addition, several more fluorescent press ingots are available today, including IPS e.max Press Impulse Opal 1 and 2, as well as Impulse Value 1, 2, and 3. We use these materials according to the case.

**...then layered**

After the pressing procedure, the frameworks were reduced to 0.5 mm and coated with a translucent layer (Fig. 7). Foundation firing at 750 °C preceded the layering procedure. After firing, the IPS e.max Ceram Essence materials were applied (Fig. 6).

These working steps demand considerable expertise from the dental technician, as the framework (MO 1 ingot) in the present case masked strong colors, and we had to ensure adequate saturation of the cervical third. However, the space for the layering materials was limited.

The Essence materials provide a good alternative in such cases. These materials are fired at 725 °C. In the case described, the subsequent layers were completed in one firing cycle (Fig. 7). This economical procedure considerably reduces the workload and heightens the efficiency of the laboratory. The thickness of the veneers was 0.5 mm in the middle third and 0.3 mm in the cervical third. The clinician deliberately prepared the incisal third of the teeth to allow sufficient space for building up the ceramic layers and for creating all of the fine details required for a natural-looking restoration.

**Morphological design**

In order to recreate the morphology of the teeth faithfully, we marked the contours and angle characteristics on the veneers with a bicolored wax crayon (Figs. 8–10). This guided us in reproducing the tooth shapes efficiently and precisely. The use of this method, which I have taught for 18 years, allows one to achieve high-quality results.

We have a collection of several thousand natural teeth at our disposal. On the basis of these samples, we can analyze the shape and surface texture of the teeth. The completed restorations were 0.75 mm thick in the middle third (0.3 mm for the framework and 0.45 mm for the veneering ceramic; Fig. 11).

Despite the limited space available, we managed to recreate the tooth color as planned. **Figure 12** shows the high saturation of the restoration in the cervical third and enhanced luminosity in the middle third. The translucent effects (absorption areas) and reflective dentine areas in the veneers are clearly discernible. When we examined the restorations on the model, we obtained a preliminary impression of what they would look like after their adhesive placement (Fig. 11).

We carefully polished the lifelike surface. The layering material was remarkably thin. Nevertheless, we managed to produce highly aesthetic anterior restorations (Fig. 14). Furthermore, after several weeks in situ, the restoration showed excellent results in terms of the periodontal considerations (Figs. 15 & 16). Undoubtedly, this successful outcome is also due to the close collaboration of Dr Stefén Koubi from Marseille, who was the clinician who treated this case. Together we were able to restore the patient’s smile with tooth shapes corresponding to the patient’s personality and tooth morphology (Fig. 17).

**Conclusion**

In cases such as the one described, veneers represent an excellent treatment option. We were able to achieve outstanding results with restorations involving pressed frameworks, which were subsequently built up with ceramic layers. This method is much easier than the conventional layering technique but provides optimum quality.

**Acknowledgement**

Special thanks go to Dr Stefén Koubi for his great personal and professional qualities.

**References**

1. G. Ubassy, Shape and Color: The Key to Successful Ceramic Restorations (Chicago: Quintessence, 1995).