IPS e.max Press and the Straumann Anatomic IPS e.max Abutment

Rehabilitation with implant-borne anterior restorations

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Replacing a single missing central incisor is quite challenging, particularly if implants are used. The precise reproduction of the appearance of the natural tooth, as well as the recreation of its characteristic layers, is not an easy task. Complementary information provided by the attending dentist is therefore very important.

The patient in this case presented with a missing central incisor, which she had lost in an accident. She was dissatisfied with her smile and wished for her upper anterior teeth to be re-aligned in order to re-establish a natural overall appearance. Following orthodontic treatment, a Straumann Bone Level Implant (BC 4.1 mm SLActive) was placed in the optimal 3-1 position (Figs. 1 & 2).

With a bit of practice and dexterity, the anatomy of a single anterior tooth can be reproduced with relative ease, provided that the model gives a detailed rendering of the adjacent teeth and thus provides all the relevant information. In contrast, the determination and reproduction of the tooth shade is a complex and difficult issue. Even small deviations may have a major detrimental effect on the success of the case. There are two reliable ways for dentists to communicate shade-related information to the dental laboratory:

1. either the attending dentist provides detailed shade information by means of digital photographs; or
2. the patient pays a visit to the laboratory so that the dental technician can establish a layering scheme.

However, it is important to note that a good layering protocol is only the first step in the creation of an aesthetic restoration, which does not guarantee its “perfect” implementation.

Photographs are an important tool in this type of procedure. In order to employ them effectively, the following conditions have to be met when taking photographs:

- The remaining dentition has to be completely missed.
- The vestigial aspect of the reference tooth must be on one level with the natural tooth. Both teeth must be positioned perpendicular to the lens of the camera.
- The shade designation on the shade tab must be clearly visible.
- Extensive reflection areas both on the surface of the natural tooth and that of the shade tab reduce the informative value of the picture and should thus be avoided.

Digital photographs simplify the identification of the differently shaded areas of natural teeth. Precise shade matching can only be accomplished if the patient visits the dental laboratory. In the present case, the necessity of a patient visit to the laboratory was discussed with Dr Couto Viana, the attending dentist. The patient fully understood our request and was prepared to pay our laboratory a visit despite the distance between Porto and Barcelona.

Zirconium oxide (ZrO2) abutments are amongst the most disputed products in implantology: their fracture strength, the internal and external connections, the interaction between retention screw and abutment—all these issues are raised repeatedly. However, there appears to be agreement that ZrO2 abutments lead to highly predictable results, especially in the restoration of anterior teeth.

Another aspect that speaks in favour of ZrO2 abutments is the material’s high biocompatibility. Soft-tissue management using consistent emergence profiles requires the given emergence profiles to be maintained clearly discernible (Figs. 3 & 4). A comparison of ZrO2 and lithium disilicate (LSi) crown materials shows that the latter can be etched and silanised and thus be optimally prepared for adhesive cementation. A special tip for readers: in order to create an etchable surface on the Straumann Anatomic IPS e.max Abutment, the bonding surface may be covered with a thin layer of veneering ceramic prior to the modelling of the crown. For this purpose, IPS e.max Ceram ZrLiner is applied first. Then a layer of IPS e.max Ceram Deep Dentin in the desired shade is applied. As a result, the dentine shade will shimmer through from within the restoration and a basis will be created for an adhesive cementation protocol.

Why use IPS e.max Press to fabricate the crown?

LSi is the material of choice in our opinion for the fabrication of single crowns (Fig. 5). Owing to its high flexural strength and aesthetic properties, this material offers the best options. However, a clear distinction must be made between anterior and posterior teeth. The occlusal load on an anterior crown has to withstand hardly comparable stress a posterior crown is exposed to. If a posterior tooth is restored with a crown, IPS e.max Press allows a reliable solution to be achieved (monolithic restoration), independent of whether the restoration is tooth or implant supported. IPS e.max Press can be used in the staining technique, the cut-back technique or the layering technique. Layered crowns have the advantage that they allow custom shade matching. However, if a simple layering scheme is applied, the range of stains available provides sufficient options for matching the shade of the crown to that of the remaining dentition. Consequently, I use IPS e.max Press HT ingots in the restoration of posterior teeth, since they offer a well-balanced mix of translucency and chroma. As far as brightness is concerned, I prefer to use shades that are one or two tones lighter.

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than the final tooth shade. This allows me to better control the brightness value. Colour saturation can be adjusted by means of Shades. In the anterior region, the requirements are completely different. While high flexural strength is not an issue, a more complex layering scheme is essential. I usually work with medium-opacity (MO) ingots, which are one tone lighter than the final shade planned. In the case presented in this article, an MO1 ingot was pressed.

Fine tuning and adjusting the fit of the restoration

The final adjustment of the shade of the restoration in the mouth of the patient plays an important role in the treatment success—any mistakes can be corrected at once. First, the IPS e.max Dentin and Incisal shades are applied together with individual characterisations, based on the layering scheme, and fired. The surface layer, which impacts translucency to the IPS e.max restoration, is not applied yet. This allows possible colour deficiencies to be adjusted directly in the mouth and inadequately shaded ceramic portions to be removed if necessary. The brightness of the first layer should not be too low, as this will make the restoration appear greyish. As indicated above, this can be avoided by using a somewhat lighter press ingot.

In the case presented, the patient visited the laboratory personally. This made it easy to establish the right level of colour saturation and brightness. Once the ceramic build-up had been optimally adjusted in terms of shade, the translucent portions could be added. At the same time, the anatomy and surface texture were completed. This was relatively easy to accomplish, as the natural counterpart reproduced in plaster provided excellent guidelines. The final stain firing cycle is important, as with the ceramic layering technique alone restorations cannot be characterised as required and the optimum dentine shade cannot be achieved. With Shades and Essentials, the intensity of the different shade areas can be perfectly adjusted. The combination of the Straumann Anatomic IPS e.max Abutment and IPS e.max Press enables restorations to be achieved that perfectly match the neighbouring teeth (Figs. 6–8).