Metal ceramic – well-proven and future-oriented

We at Dentallabor Cera-Tech in Liestal/Switzerland, concentrate to a large extent on CAD/CAM technology and spend a lot of time advocating the cause of allceramics. Nevertheless, metal ceramic comprises around 30% of our range of products and services, continues to remain an indispensable part of our programme. Gold accounts for 70% of this, and - trend increasing - non-precious metal alloys 30%.

The following article presents a corresponding case example.

Customer requirement and planning

The patient’s tooth 11 was fractured and tooth 21 showed severe cracks (fig. 1). The requirements of the dentist were clearly defined, and communicated by oral agreement and an order form: the crowns were to be implemented as a standard restoration in metal ceramic, and at the same time blend harmoniously with the patient’s oral situation.

For this reason, we decided to have the shade determination performed in the dental practice, and instead of using the casting technique, to fabricate the crown coping by milling a CAD/CAM restoration from a non-precious metal alloy. For the veneer we chose VITA VMK Master, a new metal ceramic for veneering in the classical style, and which promises brilliant shade reproduction.

The implementation

For shade determination we use – with growing enthusiasm – the VITA Linearguide 3D-Master, which is also finding increasing approval on the part of our dentist customers. We like the fact that it is based on the already known linear principle because it does not require any rethinking in terms of the concept. Also in the case described here, the dentist used this for determining the tooth shade. In addition to this, he documented the situation prior to treatment and the results of shade determination with regard to lightness and chroma by means of digital photographs which he sent us by e-mail. Further discussion of the case took place by telephone. This procedure usually enables us to achieve a remarkably high degree of accuracy, even without the dental technician having come into contact with the patient in person.

The master model was scanned and used as a basis for the virtual framework design, and the latter was milled from a non-precious metal alloy. An important prerequisite for digitisation is that the dentist must be accurate in his preparation work, so that the preparation margin can be easily read by the scanner. The risk of cavities and porosities which could endanger the veneer, and in the event of late cracks result in work covered by guarantee, is no longer given in CAD/CAM manufacture, since the non-precious metal blanks are industrially fabricated ac-

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For the opaque application we use the SPRAY ON procedure (fig. 2), so that a thin and homogeneous layer thickness is achieved, which at the same time has good covering power. The
restoration was built up using the classical dentine/enamel layering known, for instance, from VITA OMEGA 900. In this way, by using an efficient layering technique, I can quickly and easily obtain an aesthetic result.

I am impressed by the stability characteristics of the ceramics. This material property is an advantage especially in the case of larger restorations.

VITA VMK Master offers a comprehensive assortment for individualisation. In this case, however, because a standard solution was requested, I kept to just a few different materials, and modelled only the mamelons. I built up the incisal edge and the approximal areas by applying ENAMEL (EN1) and OPAL TRANSLUCENT (OT1) (fig. 3). The restoration was fired at 950°C, the approximal and palatal contacts adjusted, the latter in the articulator with lateral and protrusion movements under canine guidance before the finishing of the restoration.

I am very impressed by the very low degree of shrinkage, which I will be pleased to take into account when layering in future. A generous application of porcelains at the approximal points in order to compensate for shrinkage is not necessary to this extent, as I am accustomed to doing with other ceramics. The final glaze firing achieves a shade brilliancy which awakens the tooth to life. There is a natural harmony between opalescent and translucent regions. As with every ceramic veneer, the actual success of the restoration can only be seen when the restoration is seated in the patient’s mouth. Only then is it possible to assess whether the crowns — as desired by the patient — are harmoniously matched to the patient’s oral situation. In our case, patient, dentist and dental technician alike were satisfied with the restoration (fig. 4).

Conclusion

Our aim is to provide an attractive solution with natural aesthetics in the VMK technique, even in cases which initially do not look very promising. If dentist and / or patient insist on a metal ceramic instead of a full ceramic highend solution, we can offer good, competitive results using our CAD/CAM system and VITA VMK Master, which is based on a combination of state-of-the-art equipment and highquality materials. Thanks to the use of a ceramic which is simple to process, pleasant to work with, and has a wide processing interval and accurate shade reproduction, which, in combination with the VITA Linearguide, enables the fabrication of crowns with natural aesthetics, time-consuming adjustments and corrections are usually unnecessary.

Fig. 3: VITA VMK Master

Fig. 5: VITA VMK Master