A new generation of denture teeth

The perfect route to aesthetic and functional dentures

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In the fabrication of removable dentures at the dental laboratory, I sometimes lack suitable anterior teeth that provide the superior aesthetics very discerning patients demand. Very often, I find myself in the situation of having to modify prefabricated denture teeth, which usually involves the incorporation of age- and indication-related characteristics, to meet the requirements of the individual case. I have always considered this situation to be completely unsatisfactory and thus have been constantly on the look-out for a solution to the problem. The purpose of this article is to give a summary of my experiences and provide insight into the development process that led to the creation of the Phonares line of denture teeth.*

I started with modelling upper and lower tooth moulds that were a faithful reflection of their natural counterparts. These moulds featured all the special characteristics that I had previously found missing in existing denture teeth during my everyday work (Figures 1 and 2). For me, it has always been the first impression that counts, in other words the overall aesthetic appearance that is conveyed in the first few seconds in which I view a tooth. These first few seconds are of crucial importance, as this is the time that it takes for me to decide on whether or not the tooth lives up to my expectations. In order to achieve a natural aesthetic outcome, life-like tooth moulds whose facial and palatal surfaces feature a truly anatomical design and impart an impression of naturally grown teeth are essential (Figures 3 to 6).

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The objective is to achieve a vibrant, but not overly exaggerated facial texture and a practical palatal and lingual design, which supports clear speech and phonetics rather than hampering it. Moreover, I prefer anterior teeth with a harmonious, layered design and selectively incorporated opalescent and translucent areas that impart them with a life-like appearance (Figures 7 and 8).

A further important aspect for me is to have a logical range of tooth moulds from which to choose. To meet this requirement I tried to incorporate several characteristics

Figures 1 and 2: Outstanding overall aesthetics of the anterior teeth.

Figures 3 and 4: Natural facial and palatal design.

into these denture teeth which can also be found in nature. This led to the development of agerelated tooth moulds which take the different needs of patients at different stages of life into account. As a result, tooth moulds can be chosen that match the age of the individual patient.

The suitable tooth moulds are selected in three simple steps:

First the basic shape is selected – on the basis of whether the teeth should have a more youthful or distinctive look.

Then the desired degree of wear is chosen. Both the incisal and facial curvature are of importance in this respect. While teeth with more rounded incisal edges and a pronounced facial curvature are designed for use in young patients (Figure 9), those with more heavily abraded incisal edges and a flatter facial curvature are suitable for the more advanced age group (Figure 10). These features are based on the natural ageing process that occurs in the oral cavity over time.

In a third and last step the size, ie the dimension of the tooth is determined by means of the diagnostic cast of the case in question. For this purpose, the teeth are classified into the categories "small", "medium", and "large". Thus tooth moulds for smaller and larger alveolar ridges are available.

Easy handling is another property I have always valued very highly as a dental technician, in addition to the aesthetic appearance and a sufficiently wide selection of tooth moulds. In these times when everybody is talking about aesthetic dentistry, removable dentures should also provide optimum "white aesthetics" (Fig 11). This is particularly true for implant-borne removable dentures, as all the parties involved, ie the patient, clinician and dental lab technician place high expectations on the aesthetic outcome and function of this complex and expensive type of restoration.

In order to achieve outstanding "white aesthetics", the interproximal contours of anterior teeth should enable the

Figure 5: Example of a naturally designed palatal aspect.

Figure 6: Silver powder discloses details of the exemplary palatal design.

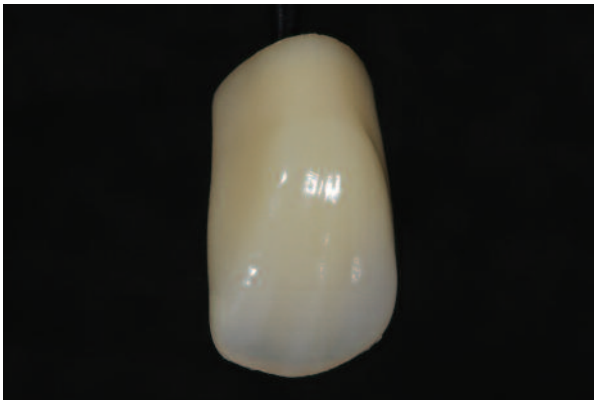

Figure 7: Example of a harmonious layering and a natural-looking opalescent effect.

Figure 8: The vibrant facial texture meets the highest aesthetic demands.

Figure 9: A rounded tooth shape and lighter shades for younger patients.

Figure 10: More distinctive tooth moulds and darker shades for patients in the more advanced age group.

teeth to be lined up very closely without creating the impression of a "white wall".

The proximal "Set & Fit" design which I have developed allows teeth to be set up in the most diverse positions without producing open gingival embrasures that appear as "black triangles" and subsequently need to be filled with denture base material. Even in the case of severely rotated teeth, a natural-looking tooth set-up can be accomplished (Fig 12).

To achieve optimum "white aesthetics", I create a soft transition between the clinical crown and the tooth neck section, as this facilitates modelling of the gingival

Figure 11: Unparalleled "white aesthetics".
Figure 12: Ideal proximal closure due to the "Set & Fit" design.

contours. By placing a wax layer that tapers towards the cervical portion of the clinical crown, the impression of naturally grown gingival tissue is created.

In order to effectively cover or frame construction elements and implant abutments, I created a cervical design which generally accommodates implant abutments with an emergence profile that is approx. 5 mm in diameter. Thus no adjustments with tooth-coloured material are required in the proximal anterior regions in most cases.

Apart from the cutting-edge Phonares anterior tooth design, the teeth are characterized by an extraordinarily high wear resistance as they are made of the new "NHC" (nano-hybrid composite) material. Due to the fact that implants are firmly anchored to the alveolar bone, materials of extremely high strength are required in the fabrication of implant-borne removable dentures. As these dentures are not supported by soft tissue, the masticatory forces are fully transferred to the materials used in the restorative process, so that they are exposed to very high levels of stress.

However, the SR Phonares NHC anterior tooth moulds are not exclusively indicated for implant-borne dentures. They can also be employed in complete and partial denture prosthetics.

Conclusion

A new line of denture teeth has been created which closely replicates the natural dentition in shape and surface texture. The teeth feature a harmonious 4-layer design and have beautiful opalescence and fluorescence. They are made of the new NHC nano-hybrid composite material, which has been proven to provide outstanding wear resistance in various studies. Consequently, high durability and excellent resistance to wear and plaque accretion can be expected. The new denture teeth allow the dental technician to achieve precise, high-quality results with little effort or difficulty.

The Phonares teeth feature a well-balanced labial and palatal design. Due to the specially designed interdental closures, a natural-looking appearance of the denture is achieved with ease.

*In the US, the Phonares line of teeth will be available as of July 2009.

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