Success without using cement

Prosthetic restoration of an edentulous mandible

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Fig. 1_Drilling template with titanium tube and lateral biteplates.
Fig. 2_OPG control of the position of the implants before exposure.
Fig. 3_Individual impression taking by means of bite registration.
Fig. 4_Fixed impression post in the individual impression by means of bite registration.
Fig. 5_Implant master cast with a gum mask and skull-related mounting of the models.
Fig. 6_Four titanium abutments, one 15° angulated abutment.

_The laboratory manufacturing of single-part laser corrected and implant-supported telescopic abutments—not a very difficult task to undertake. In the following we would like to explain the advantages of this cement-free method, as well as the related method for bite registration-supported individual implant dental impression.

A 50-year-old male patient with pronounced cardiovascular disease and instable complete mandibular denture was referred to us for prosthetic rehabilitation. After being informed of the different options for restoration, the patient chose a telescopic restoration on four interforaminal placed implants. Using the backward planning method and with the aid of the existing complete mandibular denture, we carried out the fixation of the bite, and took a functional impression by using a low viscosity A-silicon type material (e.g. Panasil Contact Plus, Fa. Kettenbach, Germany). On this basis, we manufactured a wax-up of a complete mandibular denture and a corresponding silicon matrix. Implant planning was transferred to the mounted complete mandibular denture model, and a template with a titanium drill guide and lateral biteplate made of light-curing resin (e.g. Primotec) was manufactured (Fig. 1). After this, the implant was inserted. Following anesthesia, a crestal cut was made from region 35 to 32 and 45 to 42. One mucoperiosteal flap for both sides of the mental nerve and the surgical site were prepared. The pilot hole preparations were made by using a drilling template. The angulation of the implants was controlled by means of parallel indicators. Thereafter, in order to achieve good osseointegration, at least three months' lasting healing time is


Fig. 1

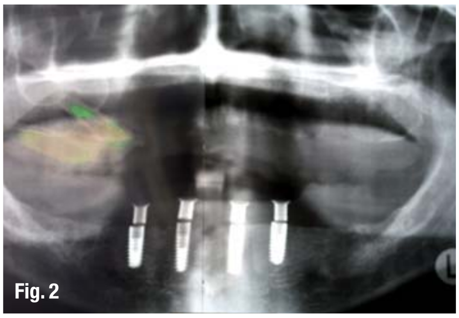
Fig. 2


Fig. 3

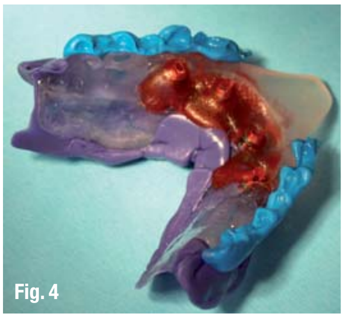
Fig. 4


Fig. 5

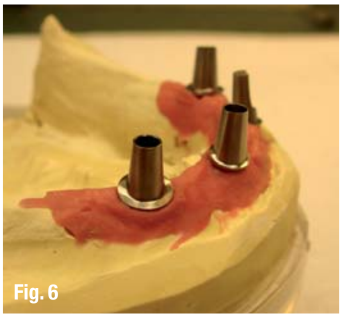
Fig. 6


Fig. 7

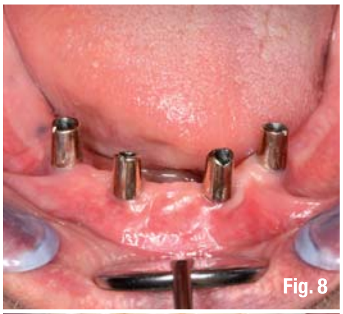

Fig. 7_Primary crown laser-welded to the titanium abutments, open in the occlusal direction.
Fig. 8_Integration of laboratory manufactured primary crowns.
Fig. 9_Control and transfer guide.
Fig. 10_Galvano secondary crown.
Fig. 11_Intraoral bonding of the secondary and tertiary constructions.
Fig. 12_Incorporation of the manufactured prosthesis.
Fig. 13_The road to success: from backward planning (above, left) to the finished prosthesis (below, right).

recommended, which is ensued by implant exposure and soft tissue conditioning (Fig. 2). The taking of impressions of four implants was carried out with an individually manufactured, bite registration-supported open impression tray made of light-curing resin, given that the position of each implant is fixed by the drilling template. The impression tray is additionally equipped with biteplates that correspond to the fixed bite opening in vertical dimension (Figs. 3 and 4). The impression taking was done by using a low viscosity A-silicon type material, which is advantageous due to the four impression posts (PITT-EASY, Sybron Implant Solutions, Germany) being connected without force or strain with self-hardening resin (GC, Pattern Resin), through the use of the individually manufactured impression tray. Additionally, this special implant impression taking technique enables a simultaneous fixation of the jaw relation, because the patient is brought into the right bite position at the time the impression materials are set using biteplates. This is followed by the manufacturing of an implant master cast with a gum mask and skull-related mounting of the models (Fig. 5). Four titanium abutments (three V.D.L. abutments Anatomic Line straight; one 15° angulated PITT-EASY abutment, Sybron Implant Solutions) (Fig. 6) were individualized according to the soft tissue profile. They were also used to determine the height of the titanium abutments of the previously manufactured silicon matrix of the complete mandibular denture. Parallel primary crowns made of resin (GC, Pattern Resin) were modeled, milled, embedded, and cast on the abutments, observing the direction of insertion. These primary crowns have an occlusally open design. They are fixed on the titanium implant abutments, and after that, welded with a laser (Fig. 7). The laser-welding of the primary crowns and the titanium abutments requires very low power, as both alloys are extremely suitable for laser-welding. The individual implant primary crowns are milled in parallel (1° or 2°) according to the initial situation. Both the amount and the height of the implant primary crown are important with regard to the alloy used. The galvano secondary crowns were manufactured afterwards. The manufacturing of the implant primary crown was carried out according to electroplating requirements, i.e. the use of copper-free noble metal alloys (e.g. Stabilor NF IV, company Degu-Dent, Germany). The galvano caps are directly galvanized onto the implant primary crown (Solaris, Degu-Dent). This is followed by the manufacturing of the transfer guide and the rotation lock with buccal labeling. The resin transfer guide is also used for control, especially before bonding the tertiary construction and the galvano secondary crown in the oral cavity (Figs. 8–11). The finalising of the implant can be done after bonding (AGC Cem, Wieland, Germany) the galvano secondary crown with the tertiary construction in the oral cavity. After the dental prosthesis had been incorporated, the patient was still under individual preventive medical supervision. The restoration did not show any radiological or clinical abnormalities (Figs. 12 and 13).

_Conclusion

The advantage of individually manufactured noble metal primary crowns, which are laser-welded to titanium abutments, is that they do not require cement for fixation. This construction can easily be removed even after its intraoral integration, and it thus guarantees the option for further extension of the prosthesis. Combining this with a telescopic galvano-superstructure also offers ideal adhesion and avoids friction. Another crucial advantage of this laboratory-based method is the cost-saving compared to industrially manufactured ready-made systems._

_contact implants

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