

Individual PEEK healing abutments and impression copings

Nature-conforming emergence profiles in implant therapy

By Camlog

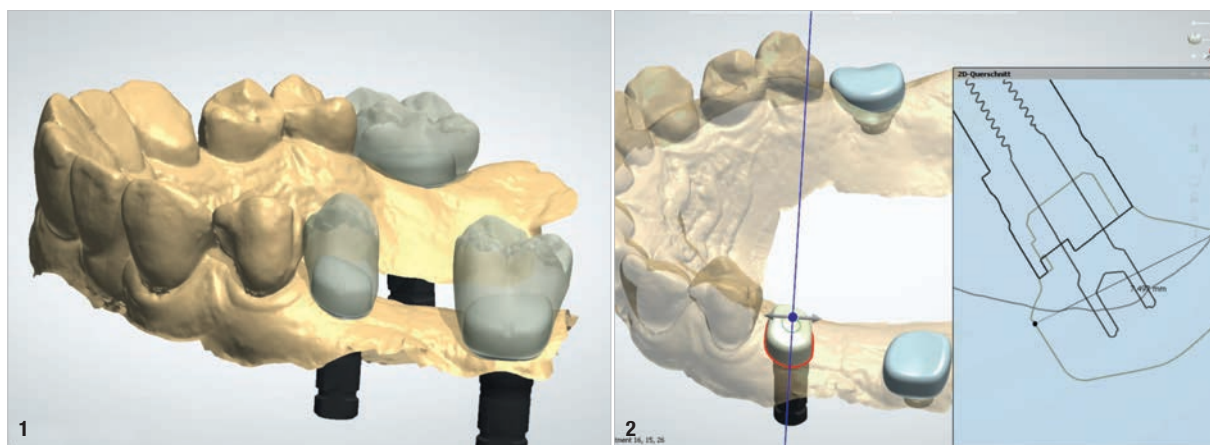


Fig. 1: Design of a customised healing abutment based on a virtual wax-up. **Fig. 2:** Design of the healing abutment and definition of the crown emergence profile. (All images: © Dr. Steffen Herzberg, Zahnärzte am Himmeloh, Witten)

The replacement of missing teeth with dental implants is an established therapeutic approach that allows predictable results if correctly indicated. The fact that dental implants osseointegrate is no longer questioned. Today, the primary focus is on preserving the peri-implant tissue structures and increasing patient comfort while reducing morbidity and treatment time as far as possible.

Camlog has established a new workflow in implant therapy with DEDICAM Services for its new customised, anti-rotation PEEK healing abutments and PEEK impression copings, which are designed on the basis of patient-specific emergence profiles and manufactured from the same data set as part of the CAD/CAM process.

The individually tailored PEEK healing abutments and PEEK impression copings, which are identical in subgingival design, enable preoperative, intra-operative and postoperative procedures for the shaping and transfer of peri-implant soft tissue—for which intensive interdisciplinary exchange between the treating teams is an advantage. The tissue-friendly PEEK material and the optimisation of the anatomical emergence profiles offer clinical benefits in that there is no additional soft-tissue manipulation required and the shaped profile can be transferred to the master cast in a precise manner. A stable soft-tissue cuff protects and nourishes the peri-implant bone and

creates the basis for a predictable aesthetic outcome of the definitive restoration.

Customised PEEK healing abutments and impression copings for Camlog implants

The individualised PEEK healing abutments and impression copings will initially be available with the connection for CAMLOG SCREW-LINE and CAMLOG PROGRESSIVE-LINE implants. They are milled in a CAD/CAM procedure from solid PEEK rod material with a diameter of 10mm. Milling PEEK requires comprehensive knowledge of material processing and quality assurance, since the patient-specific products demand the highest precision in manufacture. PEEK has been in clinical use in implant dentistry for many years and is predominantly used to fabricate provisional restorations. The PEEK healing abutments are approved for use in the oral cavity for a duration of 180 days. They can be ordered individually or as a set including an impression coping. The posts are available for use with either the open- or the closed-tray technique. Utilising the libraries provided for the CAD software from 3Shape and exocad, registered DEDICAM customers can design the healing abutments themselves and order their subsequent manufacture. Based on the same data set, the impression copings can be manufactured upon request as well.

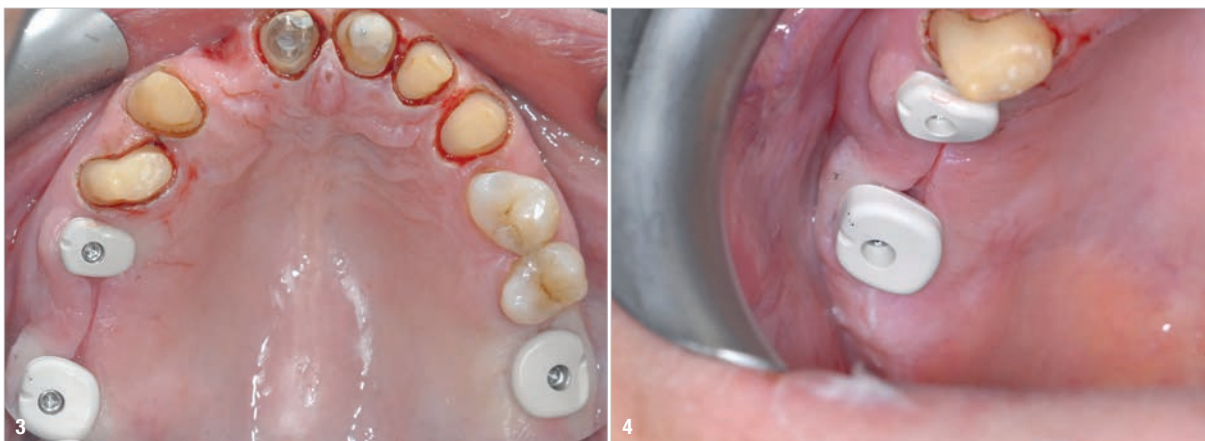


Fig. 3: Customised PEEK healing abutments inserted immediately after implant exposure. **Fig. 4:** The customised PEEK healing abutment supports the soft tissue for healing of the mucosa in an anatomical way.

For easy orientation of the individual products in the oral cavity, it is recommended to apply a visual marking in the form of a small indentation on the healing abutment, as well as the impression copings.

By integrating the digital process chain and the multifaceted workflow possibilities in the dental practice and laboratory, patient-friendly concepts can be realised in a cost-efficient manner and are easily adapted to the individual infrastructure and requirements of the respective treating team. In addition to 3D radiographic diagnostics, virtual 3D implant planning, intra-oral scanning and guided implant placement, individually created implant components achieve the optimal conditions for a customised prosthetic restoration. Besides individual planning, customisation extends to every prosthetic component, which can be manufactured in an individualised and precise way by means of CAD/CAM technology. The application of the customised PEEK healing abutments is characterised by great flexibility of the workflow. In the following, three possible workflow options are shown.

The digital way

Based on the implant planning, which employs backward planning, the anatomical emergence profile is established, the subgingival area is designed to support the tissue and the height of the healing abutment is determined. In addition to a surgical guide, the healing abutment and, if desired, the impression coping are ordered from Camlog regarding their design and manufacture. Alternatively, the design can be done in the laboratory by using the DEDICAM CAD library. After guided surgery, owing to the exact positioning and alignment of the implant's internal configuration, the healing abutment can be placed as part of the one-stage immediate restoration procedure. The inserted healing abutment heals uncovered, and the soft tissue shapes itself anatomically based on the cap's emergence profile. If covered healing is preferred, the healing abutment is inserted after exposure, in conjunction with soft-tissue thickening in the form of a roll flap if necessary. If the healing abutment has shaped the soft tissue such that it is adequately supportive, the

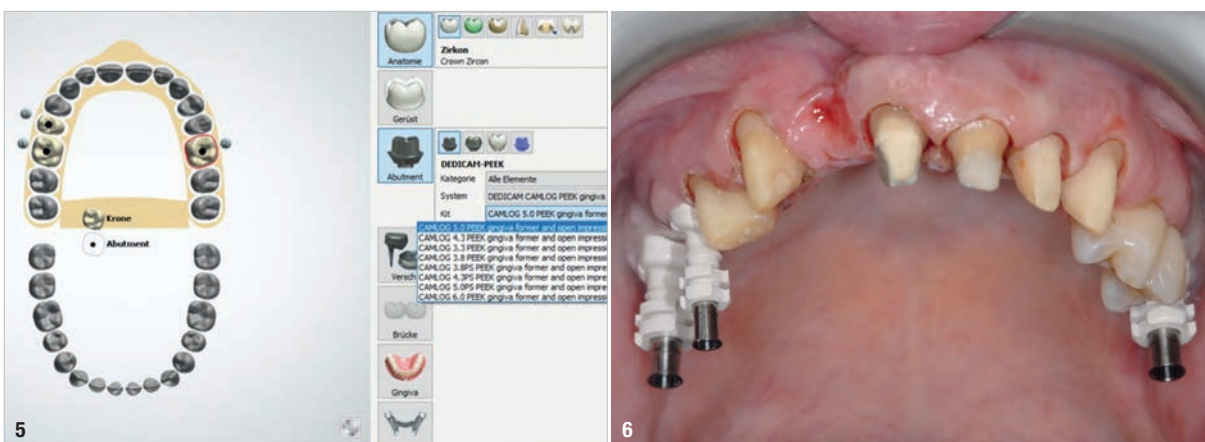


Fig. 5: When using 3Shape Inbox, customised impression copings, which are of subgingival design identical to that of the healing abutments, can be ordered with one click. **Fig. 6:** After healing of the soft tissue, the customised impression copings allow the exact transfer of the soft-tissue situation and the implant position to the model, even in complex restorative cases.



Fig. 7: The design of the impression copings ensures the anti-rotation transfer of the situation to the master cast. **Fig. 8:** The definitive restoration with a stable and anatomically formed peri-implant mucosa.

design can additionally be used without modification to design the definitive abutment. If changes are required, the current soft-tissue situation can be recorded using an intra-oral scan taken from the implant shoulder. However, for complex rehabilitations with bridge restorations on the implants, analogue impression taking with the PEEK impression posts has been proved to be advantageous.

The partially digital way

The partially digital way is characterised by collaboration between the surgeon, referring dentist and dental technician. In coordination with the prosthodontist, the surgeon places the implants and scans them prior to covered healing. When the implants are exposed, the customised healing abutments are employed to anatomically shape the peri-implant soft tissue. After tissue healing, the prosthetic restoration commences in the practice of the referring dentist. There, the dentist deals with a perfectly shaped mucosa, which is transferred to the laboratory for the fabrication of a master cast by means of the individual impression copings in an analogue procedure without any additional effort. Based on the preferences of the dental technician, the implant restoration is then fabricated in either analogue or digital fashion.

Outsourcing to the production centre— a mix of analogue and digital

The surgeon takes an implant impression or scans the implant position intra-operatively. He sends either the physical models or the scan data together with a situation scan and an opposing arch scan to Camlog. The skilled dental technicians at the DEDICAM Service centre design the patient-specific healing abutment in consultation with the treating clinician and submit a manufacturing order for the healing abutment and impression coping to the production centre. There, both are manufactured with high precision and are available in the practice when the implant is exposed in order to obtain the best clinical conditions for an anatomically shaped mucosa.

Conclusion

With the individual PEEK healing abutments and impression copings, the workflow is flexible and convenient for everyone involved. The virtually designed patient-specific emergence profile can be safely controlled from the time of implant placement until the realisation of the definitive restoration. There is no need to manipulate the soft tissue, as would be the case after removing a standardised healing abutment. An impression coping with exactly the same emergence profile, since it is created from the same data set, prevents the mucosa from collapsing and transfers the shaped soft-tissue profile for the fabrication of a form-congruent abutment. The easy handling, the achievement of a predictable result and the reduction of treatment appointments, pain and work steps distinguish this patient-friendly treatment concept. The work required for crafting a model or a silicone key for analogue fabrication of individualised impression copings with composite is eliminated. With this treatment concept, surgeon and prosthodontist work closely together with the laboratory and Camlog for the ultimate benefit of the patient.

PEEK has established itself in implant therapy as a tissue-friendly material for provisional restorations.¹⁻³ In addition to optimising the mucosa and preserving the alveolar bone, an anatomically designed emergence profile creates the basis for the natural red-white aesthetics of the implant restoration. The use of customised healing abutments and impression copings is time- and cost-efficient and a valuable part of a patient-friendly treatment concept.

DEDICAM Services are not available in all countries. Please contact your local BioHorizons Camlog sales representative for further information.

Editorial note: A list of references is available from the publisher.