

# SYSTEMATIC IMPLANT-PROSTHETIC REHABILITATION OF A PATIENT WITH GENERALIZED AGGRESSIVE PERIODONTITIS

a perfect fit™



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Dr Michael Stimmelmayer successfully completed his studies in dentistry in Regensburg, Germany and received his doctorate in 1992. After several years as a research associate in the Department of Dental Prosthetics at Ludwig-Maximilians University (LMU) Munich and as a surgery resident in a practice for oral and maxillofacial surgery and plastic surgery in Munich, he attained the specialist designation of an oral surgeon. After additional university-related activities in Munich and San Francisco, California, Dr Stimmelmayer founded his own practice in Cham, Germany in 2000 and furthered his education in the field of implant dentistry and periodontics. In 2001, he qualified as an "implantologist" with the European Association of Dental Implantologists (BdiZ) and was named an EDA Specialist in Periodontics. Since 2005, he has also been active as a certified consultant of the German Society of Implantology (DGI) and the Academy of Practice and Science (APW). Dr Michael Stimmelmayer can look back on many years of implant-prosthetic and implant-surgical experience. He is also a long-time user of the CAMLOG® Implant System, is one of the consulting experts to CAMLOG and for several more years, has been a speaker at home and abroad for CAMLOG.



## IMPLANTS USED

Tooth	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
Impl. type				SL	SL		SL			SL		SL	SL			
Impl. length				13.0	13.0		13.0			13.0		13.0	11.0			
Impl. Ø				3.8	3.8		3.8			3.8		3.8	3.8			
Impl. surface				PP	PP		PP			PP		PP	PP			

Tooth	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
Impl. type			SL	SL					SL			SL	SL	SL		
Impl. length			13.0	13.0					13.0			13.0	11.0	13.0		
Impl. Ø			4.3	3.8					3.3			3.8	3.8	4,3		
Impl. surface			PP	PP					PP			PP	PP	PP		

Impl. type: ROOT-LINE (RL) / SCREW-LINE (SL) Impl. surface: Promote (P) / Promote Plus (PP)

## PROSTHETICS

- standard
- platform switching
- removable
- fixed
- crown
- bridge
- cemented
- screw-retained
- partially edentulous
- edentulous
- others
  
- Universal abutment
- Esthomic® abutment
- Telescope abutment
- Gold-plastic abutment
- Ceramic abutment
- Individual zirconium abutment on titanium base
- Logfit® abutment
- Locator® abutment
- Ball abutment
- Bar abutment
- others

## INFORMATION ON PATIENT AND TREATMENT

The 71-year-old male patient arrived at our clinic for the first time in April 2008 with acute dental pain in the left maxilla. After a comprehensive examination, only teeth 33, 32, 41, 42, 43 and 44 could be retained due to the generalized chronic and localized aggressive periodontitis and the hard-tissue defects.

After extracting the teeth not worth preserving, provisional maxillary and mandibular dentures were fitted, the insufficient crowns removed and the remaining teeth provided with new fillings and temporary solutions. After the initial periodontal treatment, the systematic PA therapy of the remaining teeth began under FMD (full mouth disinfection) and antibiotics. During the hygiene phase, implant planning was carried out using x-ray-opaque positioning templates and Med3D analysis (Hafner). We agreed with the patient about the following care: removable, palate-free bar restoration in the maxilla, fixed crown restoration in the mandible. The PA findings were reevaluated 3 months after the PA therapy. Because no periodontal pocket showed a depth of more than 3 mm, the implant therapy could begin.

First, six implants in regions 15, 14, 12, 22, 24 and 25 were inserted in the maxilla. Because of an additional minimal lateral augmentation of the tuber region with natural bone and an internal sinus lift of region 25, primary closure of the wound was carried out. Implantation of regions 36, 35, 34, 45, 46 and augmentation of region 31 were carried out 6 weeks after maxillary implant placement. Open healing of the posterior implants was selected.

The implant of region 31 was placed four months after augmentation at the time of implant exposure in the maxilla. Because of the previous dermatoplasty during wound closure, advancement flap technique with repositioning of the mucogingival line was required for the maxilla. A split flap was prepared while leaving the periosteum intact and the flap was positioned apically.

Six weeks after implant exposure and implant placement of region 31, prosthetic treatment began:

Bar abutments were mounted in the maxilla and a closed tray impression was taken with bar impression caps and traditional Impregum. On the mandible, teeth 33 and 44 were prepared and an impression was taken

with snap impression posts using a closed tray technique and a second impression with screw-retained impression posts and open tray technique prepared. All impressions were sent to the laboratory and models created.

Because the impression taken with bar impression caps is very inexact (substantial mobility in the impression material) and we are reluctant to bond the bar to the bonding basis, we make do with the following additional technique:

Using the burn-out bar abutment, we fabricate transocclusal screw-retained impression posts out of economy alloy, which can be screwed into the bar abutment and lab analogs using long fixation screws. A self-curing polymer is used to bond the custom impression posts to the plaster cast and after the plastic has cured, the impression posts are thinly separated, again. These impression caps are then screwed onto the bar abutments in the correct position in the mouth, the gap between each plastic splinting checked for patency and then bonded again in the mouth using self-curing polymer. This is done in the following order:

1. Impression posts regions 15 with 14, 12 with 22 and 24 with 25
2. Plastic block region 15, 14 with 12, 22
3. Plastic block region 15, 14, 12, 22 with 24, 25

Impregum and an individual impression tray are then used to take the impression. In this manner, a stable impression is achieved with perfect transfer of the bar abutments.

After phonetic and esthetic shaping of the lip profile, a centric bite registration is made using registration posts, Kerr, Aluwachs and TempBond. The upper teeth are positioned in the dental laboratory according to phonetic and esthetic guidelines followed by the try-in on the patient. The Esthomic abutments can then be customized in the mandible and the metal-ceramic crowns fabricated. At the same time, the custom-milled bars are fabricated using castable high gold content bar bases. For the best fit, the solid bar is passivated in the laboratory. After bar and crown try-in, the work is finished by the dental technician. Insertion of the abutments and crowns in the mandible and insertion of the bars in the maxilla is followed by an occlusion check and another centric register with Kerr, Aluwachs and TempBond for reassembly of the palate-free bar restoration. This is done by the dental technician, the work is revised again and then inserted definitely on the next day.

### Initial situation and implant planning

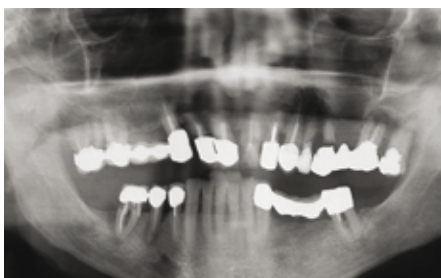


Fig. 1: Initial OPG with recognizable massive periodontitis and caries.



Fig. 2: Edentulous maxilla 3 months after extraction.



Fig. 3: med3D planning of the edentulous maxilla.

**Surgical procedure**



Fig. 4: Planning of the partially edentulous mandible.



Fig. 5: Insetion of the six SCREW-LINE Promote® plus implants each with a diameter of 3.8 mm.



Fig. 6: Primary closure in the maxilla with a combination of horizontal mattress sutures (GoreTex 6-0) and simple interrupted sutures (Stoma Mersilene 6-0).



Fig. 7: Transversal bone deficit region 31.



Fig. 8: Augmentation with autogenous block graft and bone chips from region 38. A Triron screw (Q-Bone System 1.0 x 7 mm) is used to fix the bone block.



Fig. 9: Implant placement in the mandible regions 36, 35, 34, 45, 46 with transgingival healing and primary closure of the augmentation site region 31 with coronal advancement flap.

**Soft-tissue management**

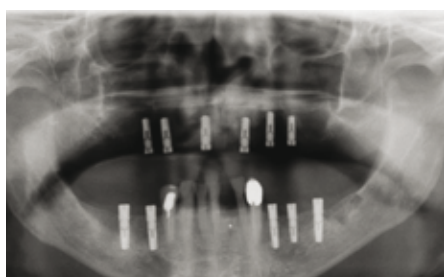


Fig. 10: Post-operative OPG.



Fig. 11: Implant placement region 31 (SCREW-LINE Promote® plus 3.3 x 13 mm) in optimally regenerated bone bed.



Fig. 12: Wound closure region 31 with transgingival implant healing and advancement flap technique.



Fig. 13: Implant exposure in the maxilla using the split flap technique and advancement flap and vestibular extension for broadening the buccally attached gingiva.



Fig. 14: Secondary wound healing in the maxilla and assembly of the bar abutment, approx. 6 weeks after implant exposure.



Fig. 15: Wound healing in the mandible before denture fabrication.

## Impression taking



Fig. 16: Installation of the bar impression caps for Impregum impression with closed tray technique.



Fig. 17: Preparation of teeth 33, 44 and preparation of the implant impression with closed tray technique.



Fig. 18: Second impression with open tray technique; note the extension of the screw entry on the impression post region 31 with a silicone hose.



Fig. 19: Burn-out plastic base for bar abutments.



Fig. 20: Custom screw-retained impression posts with long fixing screw.



Fig. 21: The deployable impression posts made of economy alloy.



Fig. 22: First maxillary model with lab analogs after the impression is taken using prefabricated bar impression posts.



Fig. 23: Individual impression posts fixed in the model, splinted with self-curing polymer (GC Pattern Resin) and thinly separated between the impression posts.

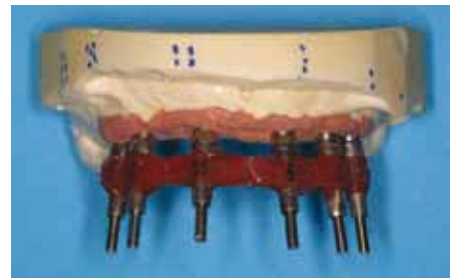


Fig. 24: Buccal view of the impression posts with respective marking.

## Prosthetic treatment



Fig. 25: Intraorally fixed and already splinted impression posts for open impression technique.



Fig. 26: Perfect impression of the bar abutments and stable transfer of the oral situation to the laboratory.



Fig. 27: Buccal view of the individually milled bar; note the wide band on buccally keratinized gingiva by the vestibular extension.



Fig. 28: Occlusal view of the bar and its screwed connection.



Fig. 29: Esthetic abutments inserted using insertion keys; the insertion keys are used to tighten the abutments as well as for protection before force is applied to the implant.



Fig. 30: Palate-free maxillary bar restoration with individually integrated palatal rugae.



Fig. 31: Front view of the customized maxillary prosthesis.



Fig. 32: Occlusal view of the integrated metal-ceramic crowns on the implants and teeth.



Fig. 33: Centric registration with Kerr, Aluwachs and Temp-Bond for reassembly of the prosthesis.



Fig. 34: Front view of the final fitted maxilla and mandible work.



Fig. 35: Final OPG; check after 2 years.

## CONCLUSIONS

With the treatment shown above, the patient was both esthetically and functionally rehabilitated to his great satisfaction. The palate-free bar restoration made nearly unrestricted chewing possible for the patient with only a minimal reduction in taste. In addition, the upper jaw front can be set up based on ideal phonetic and esthetic perspectives independent of the position of the implant. For pronounced alveolar ridge atrophy in the upper jaw front, this is a significant advantage over a fixed restoration.

Using our special impression technique of the bar abutments, we have the opportunity to create highly tension-free, custom-milled bars. The mandibular restoration with the respective single tooth restorations allows the patient to chew well and simplifies cleaning. As an alternative, the augmentation and implantation of region 31 could have been omitted and a single-leaf resin-bonded bridge used.



## **LITERATURE**

### **NELSON K, SEMPER W, HILDEBRAND D, ÖZYUVACI H**

A retrospective analysis of sandblasted, acid-etched implants with reduced healing times with an observation period of up to 5 years. Int J Oral Maxillofac Implants **2008**; 23:726-732

### **SEMPER W, HEBERER S, NELSON K**

Early loading of root-form and conical implants with a sandblasted large-grit, acid-etched surface: a 6-year clinical follow-up. Implants **2008**; 2:14-19

### **FRANK J, STACHULLA G, NODLBICHLER S**

Maxillary and mandibular full-arch rehabilitation: A complex case. EDI **2010**; 6(2):58-68

## **SUPPLIERS**

Suture material: Mattress sutures: Goretex 6-0, Gore;

Simple interrupted sutures: Mersilene 6-0, Stoma

Impression material: Impregum, 3M-Espe

Registration material: GC-Compound, GC

Kerr-Stangen, Kerr; Aluwachs; TempBond, Kerr

Three-dimensional implant planning: implant med3D, Hafner

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