J. Thomas Lambrecht (Editor)

Oral and Implant Surgery:

Principles and Procedures

In collaboration with:
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B. Hoffmeister, Th. Kreusch, K. Wangerin

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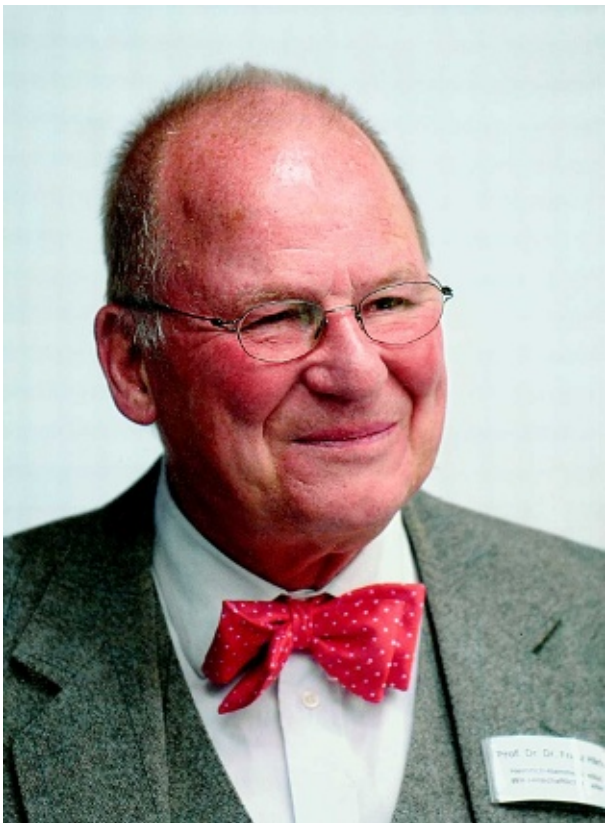
The Kiel Connection
dedicate this book
to their teacher



Prof. Dr. med. Dr. med. dent. Franz Härle
Director of Department
of Oral and Maxillofacial Surgery,
Kiel University 1980–2004
and Dean of the Medical Faculty
of Kiel University 1991–1992

Preface

Outpatient surgery performed by oral surgeons and maxillofacial surgeons has been subject to various influences and exposed to new trends in recent years:

- patients are getting older and older
- owing to the associated increase in systemic diseases, the operations are becoming more complex and overall treatment involves more risk
- the forensic implications are more signigficant
- innovations in operating technique and materials have made surgical procedures possible that place high demands on the infrastructure, logistics and expertise of the treatment team
- the forms of doctor–patient communication have changed as a result of the Internet; patients no longer look for their doctor or dentist in the phone book but on their website and they no longer attend a consultation uninformed, but are focused and fully informed.

It is not easy to address all these points in a single textbook or reference book.

The book presents examples of intraoral operations, in many cases showing the step-by-step operating procedure, which can obviously vary from patient to patient and from clinic to clinic. A whole chapter is dedicated to endosseous implantology, contrasting it with tooth-preserving surgery as an alternative approach.

A selection of cases is also presented, which must be aligned with the self-assessment and proficiency of each particular surgeon. A central theme of 'safety' runs throughout the entire book, from the principles of preoperative information to patients, to intraoperative complications and their possible consequences through to dealing with at-risk patients. This should, therefore, interest anyone already working in or currently studying this specialist field. Unfortunately, ever-expanding knowledge means some omissions are inevitable in order to keep within the scope of this book. Readers may wish to refer to the extensive specialist literature published by Quintessence.

The bow ties on the cover were hand-made in Vienna. The bow tie in the center is printed with the logo of the Congress of the German Society of Oral and Maxillofacial Surgery, which was held in Kiel in 1994 and chaired by Professor Härle.

The Kiel Connection – former senior residents and lecturers of Kiel University Department of Oral and Maxillofacial Surgery – were generously supported in producing this book by Prof. Dr. A. Filippi, Basel, Switzerland, and colleagues from Vienna University Hospital, Dr. H. Fahrenholz, Dr. Dr. A. Reichwein, Dr. K. Schicho, Dr. K. Sinko, Mag. E. Stein and Prof. Dr. D. Turhani.

We are grateful to all our colleagues who contributed their illustrations to the book. As well as our dental assistants and medical consultants, the following people have helped to make this book a reality: Dr. C. Bernsmeier, Prof. Dr. W. Ummenhofer, Prof. Dr. Dr. M. Kunkel and Prof. Dr. N. Zitzmann. Last, but not least, we would like to thank all our secretaries, especially Ms. G. Oertlin and Ms. B. Olufsen, and give special thanks to Ms. S. Holmes for her superb translation.

We would also like to thank Quintessence and its staff for the flexible, swift and ever-friendly support they provide.

J. Thomas Lambrecht

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Andreas Filippi

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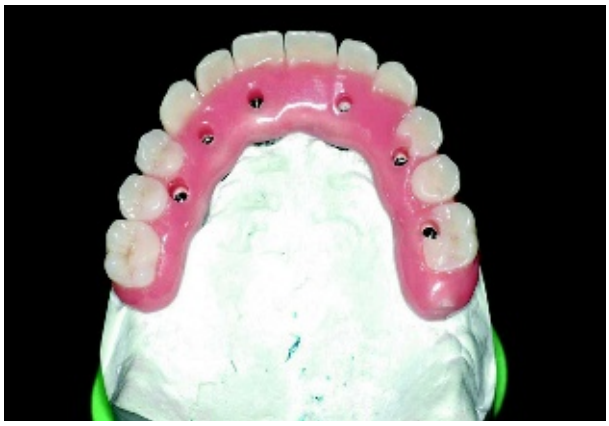

Fig 8-430 Finished work on the model; the acrylic resin teeth set up on the titanium framework are coated with polyan.

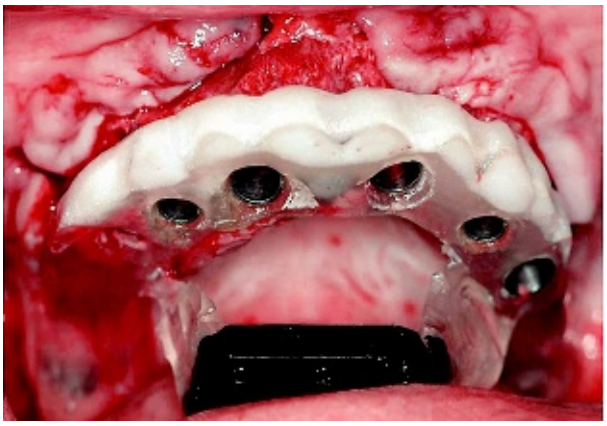

Fig 8-431 Fitting the drilling template on to the three temporary ball head implants in preparation for implantation.

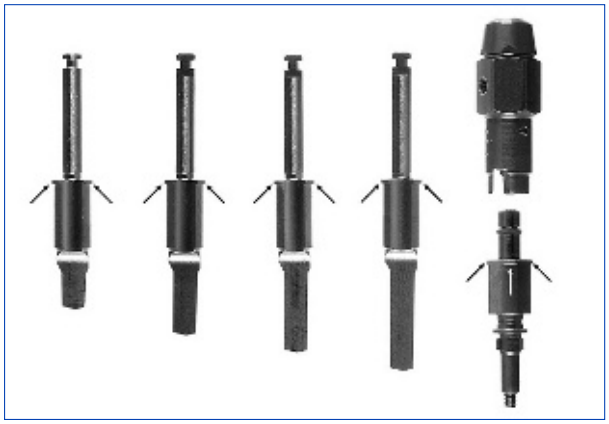

Fig 8-432 Specially developed CAMLOG instruments are used for implant insertion through the drill sleeves: pilot drill, three drills in 9, 11 and 13 mm lengths and an implant applicator for the wrench instrument (arrows point to the stoppers).

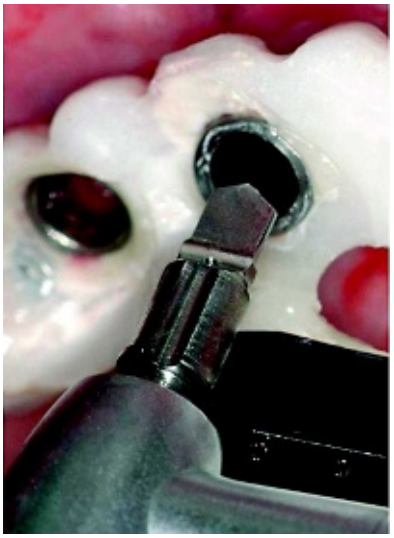

Fig 8-433 Drilling the implant bed with the 9 mm long drill.

of error because inaccuracies at least remain 'consistent'; there is no accumulation of errors in the course of the individual working steps.

Intraoperative realization

The operation is performed under local anesthesia using the same drilling template with which the model implants were inserted in the laboratory (Fig 8-431). All the working steps described below are performed through the guide sleeves of the template. The implant system is matched to the guide sleeves so that the mucosa can also be punched out through the template. For preparation of the implant bed, special instrumentation was developed for the CAMLOG system (Fig 8-432). Three or four deep-hole drills are used, depending on the length of the implant (Fig 8-433). Implant insertion is performed manually, again through the drilling template, with torque control to avoid overheating (Fig 8-434). The vertical position of the implants (implant depth) is determined by the guide sleeve position, while it is impossible to insert the implants too deeply because of the placing of the three stoppers on the guide track (Fig 8-435).

Following implant insertion, the implant applicators (Fig 8-436) are removed and the fixed partial denture buildups are screwed on. The titanium sleeves

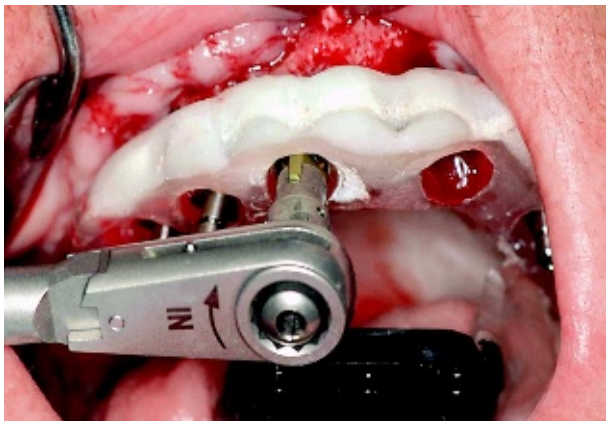

Fig 8-434 Inserting the implants through the sleeves in the drilling template with the torque wrench.

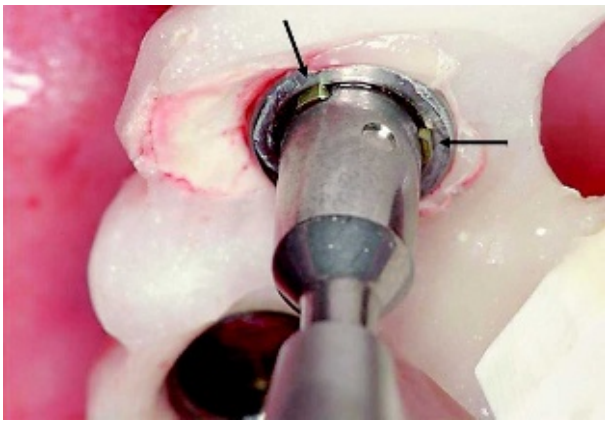

Fig 8-435 The depth of implant insertion is mechanically determined by three stoppers (arrows).

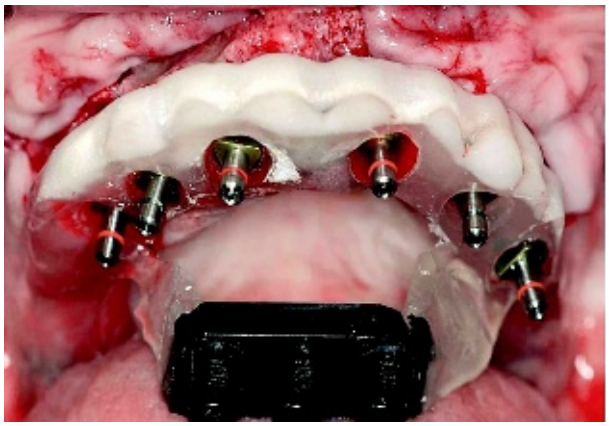

Fig 8-436 The six implants are placed; the drilling template with the black base stone is still *in situ*.

Fig 8-437 Fitting the implants with titanium sleeves, which are intended to receive the long-term provisional appliance. In this case, a titanium bar is inserted. The temporary ball-head implants are still required for positioning the long-term provisional appliance.

can be adapted to the implants with another screw connection. In this way, it is possible to ensure tension-free insertion of the prosthetic work already completed preoperatively (Figs 8-437 and 8-438).

Before final insertion of the prosthetic work, a try-in and verification of the exact accuracy of fit (over the ball-head implants) takes place. Then the prosthetic work with titanium sleeves is finally bonded in the patient's mouth. After the bonding agent has set, the prosthetic work (e.g. a long-term provisional) can be unscrewed. The ball-head implants in the alveolar process and the matrices in the prosthetic work are then removed.

Fig 8-438 The framework is fitted, which can be bonded in place. Performing this work intraorally is a prerequisite for tension-free seating of the fixed partial denture.

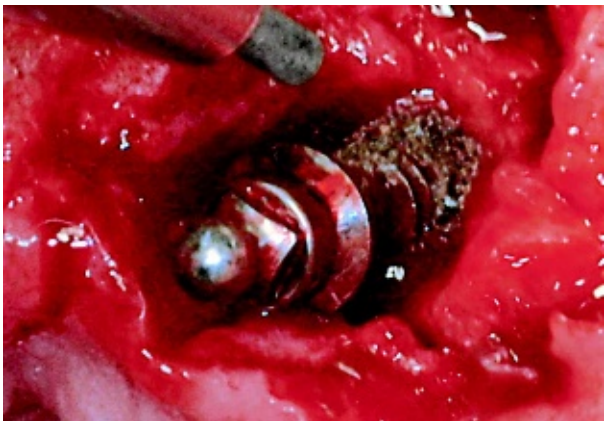

Fig 8-504 Decontamination with CO_2 laser.

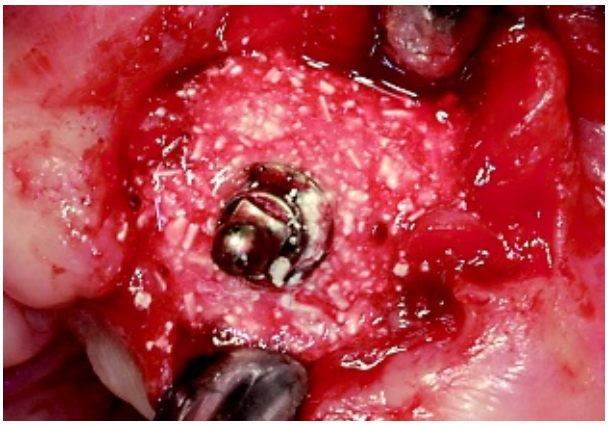

Fig 8-505 Filling the peri-implant defect with a mixture of algisorb and Emdogain.

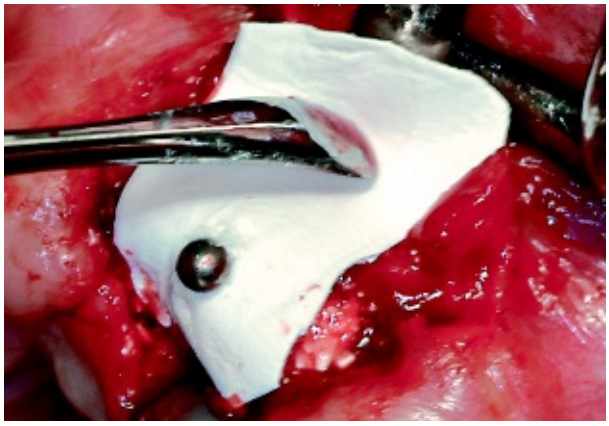

Fig 8-506 Covering with a Bio-Gide membrane.

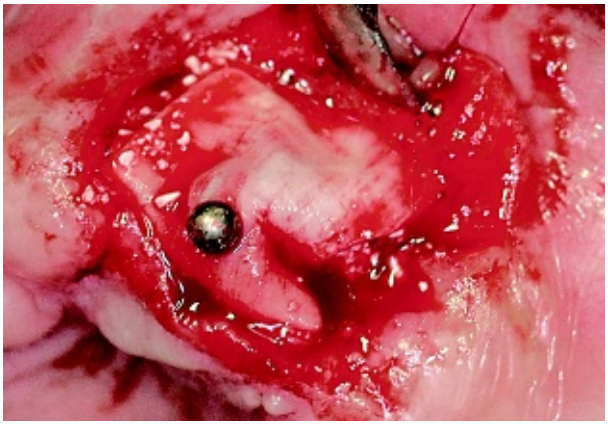

Fig 8-507 Folding back the mucoperiosteum.

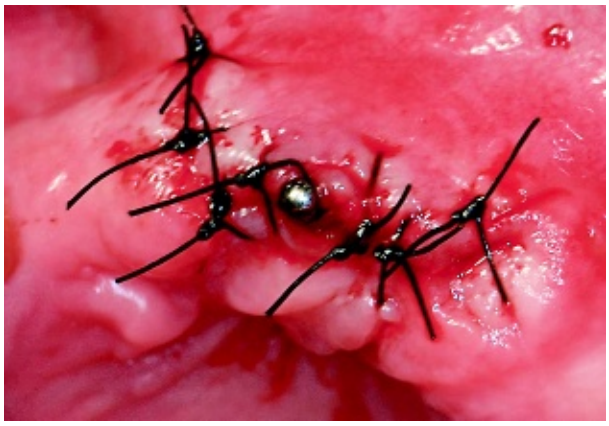

Fig 8-508 Condition after suture closure.

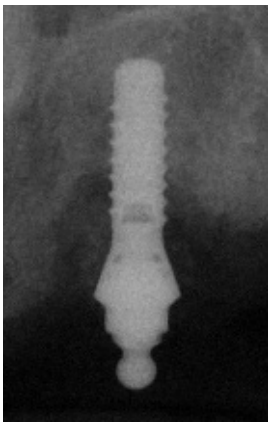

Fig 8-509 Postoperative dental film showing that the peri-implant defect is filled up again.

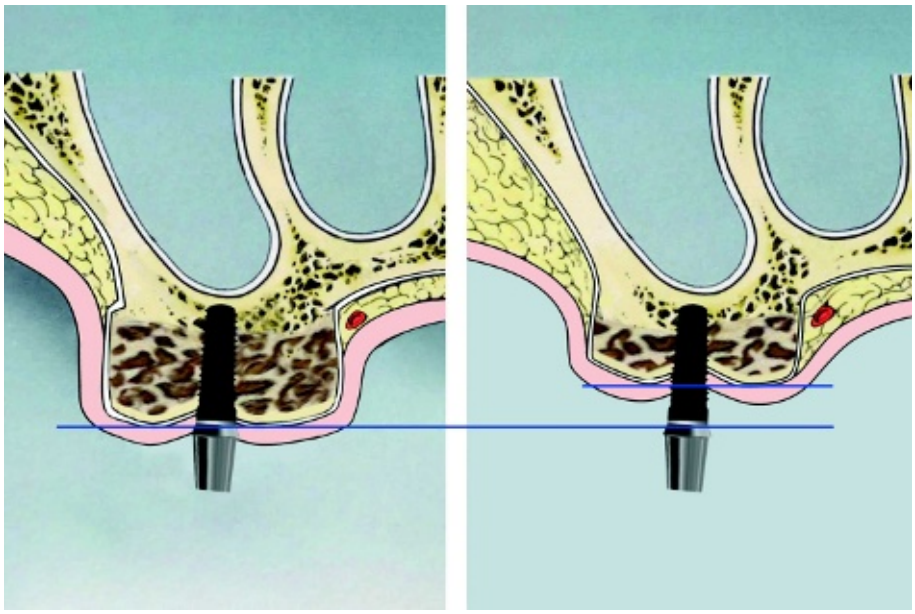

Fig 8-510 An onlay plasty (class IVa bone) in the maxilla (left); owing to poor vascularization, the grafted bone is resorbed and the implant is exposed in the crestal area (right).

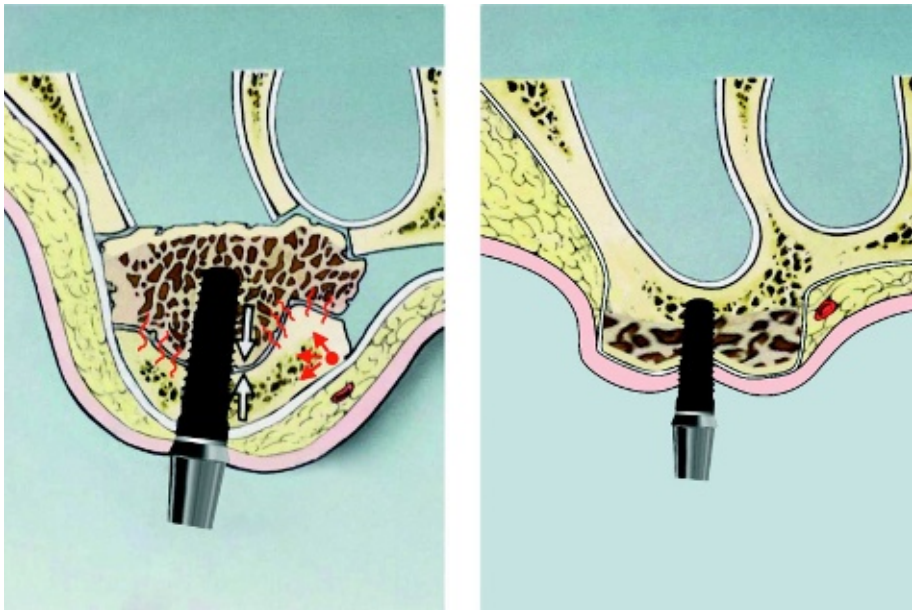

Fig 8-511 Comparison of bone interposition for the inlay graft (class III bone) (left) with the onlay bone apposition (class IVa bone) (right). The bone should be locally vascularized in the area where the implant passes through so that crestal bone resorption does not take place.

Bone resorption: comparison between inlay and onlay graft

Finally the key theme of this chapter, the vascularization of different bone grafts and bone formation options, should be mentioned again.

The situation of an onlay graft (class IVa) in the maxilla is illustrated in Figure 8-510. Owing to the lack of vascularization with the onlay graft, there is pronounced resorption (up to 50%) of the grafted bone and hence exposure of the implants in the crestal region.[197] Figure 8-511 compares the onlay graft (class IVa), which is far simpler to perform, with the more difficult horseshoe Le Fort I osteotomy (class III). Autogenous monocortical bone grafts are used for both operation methods. There is adequate vascularization as a result of the inlay interposition of grafted bone between the cranial bone of the maxilla, the nasal and maxillary sinus walls, the palatal bone and