

# ITI

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# Treatment Guide

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Volume 4

Loading Protocols  
in Implant Dentistry  
Edentulous Patients



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## The ITI Mission is ...

“... to promote and disseminate knowledge on all aspects of implant dentistry and related tissue regeneration through research, development and education to the benefit of the patient.”

# ITI

## Preface

# Treatment Guide

Since the introduction of implant dentistry some 40 years ago, much has changed. The development of implant materials and implant design, the evolution of prosthetic materials and prosthetic design, and the optimization of surgical and prosthetic treatment protocols have opened this field of dentistry to a large group of treatment providers and patients. Oral implantology has provided edentulous patients with denture retention, immensely improving their quality of life. Based on research in the field and increased practical knowledge, a treatment involving two implants has now been described as the standard of care for retaining an overdenture in the edentulous patient.

Innovation, knowledge, and experience have led to improved implant designs and optimized treatment protocols. Research and treatment evaluations have shown us how to optimize the biomechanical design of the superstructures and taught us how to select patients for the different treatment protocols, making oral implantology an ever more predictable treatment option. Over the past 40 years, we have gone from 6 months of healing in the edentulous maxilla and 3 months in the edentulous mandible to immediate loading protocols for a large group of patients and many treatment indications.

Computer technology and CAD/CAM are playing a more dominant role in oral implantology. Guiding systems and computer-assisted superstructure manufacturing have given clinicians the tools required to develop an entire treatment plan in a virtual environment. This is the direction in which oral implantology is rapidly developing.

In August of 2008, the ITI met at the 4th ITI Consensus Conference in Stuttgart to discuss a large number of topics, including loading protocols for edentulous patients and computer technology and CAD/CAM for edentulous patients. The proceedings of this conference were published in a supplement to the International Journal of Oral and Maxillofacial Implants in 2009.

This Treatment Guide provides a summary of the findings and statements of the 4th Consensus Conference, completed with the underlying scientific evidence. Based on these statements, guidelines and recommendations are provided for the various treatment options for edentulous patients, illustrated with detailed case reports.

The authors hope that this fourth volume in the series of ITI Treatment Guides will provide clinicians with a sound resource to turn to when developing treatment plans for their edentulous patients.

Daniel Wismeijer



Daniel Buser



Urs C. Belser



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# Loading Protocols in Implant Dentistry

## 1 Introduction

D. Wismeijer

The mission of the ITI is to promote and disseminate knowledge about all aspects of implant dentistry and related tissue regeneration through research, development, and education. During the first decade of the 21st century, the leading role of the ITI in informing the dental community as well as its patients was highlighted by various relevant endeavors coordinated by the ITI Education Committee:

- The ITI Consensus Conferences periodically update the body of evidence on which many clinical approaches in implant surgery and implant prosthodontics are based. These conferences lead the way for clinicians in the field to provide their patients with evidence-based care.
- The ITI Treatments Guides provide clinicians with objective recommendations for implant treatment. These recommendations and treatment concepts based on the outcomes and recommendations of the ITI Consensus Conferences and are supported and illustrated by experienced clinicians.
- The Glossary of Oral and Maxillofacial Implants is another tool for professionals in the field of implant dentistry. With its more than 2000 terms in various areas, it is the standard work in the field.

- The SAC Classification in Implant Dentistry (2009) is a reference tool for practitioners when selecting treatment approaches for individual patients. It allows them to assess the degree of complexity, the risks involved when treating the individual patient, and the skills required to provide the necessary treatment. This publication is based on an ITI conference on this subject held in March 2007.

The 4th ITI Consensus Conference was held in August of 2008, discussing various topics in implant dentistry, including loading protocols and applications of computer technology. The proceedings of this conference were published in a supplement to the International Journal of Oral and Maxillofacial Implants (JOMI) in 2009.

This Treatment Guide, the fourth in the series, focuses on the treatment of the edentulous patient. Based on the body of literature that was studied for the 4th ITI Consensus Conference and the ensuing recommendations and results, an evidence-based approach is presented and supported by detailed case reports. We hope that this fourth Treatment Guide—like the previous three—will once again be a useful tool for clinicians in achieving their treatment goals.



Fig 26 Locator analog.



Fig 27 Locator analogs in the rebasing impression.



Fig 28 Master cast.



Fig 29 Maxillary denture, occlusal view.

The rebasing and attachment indexing were planned to facilitate the return of the mandibular denture at the same appointment. Locator abutment analogs were positioned in the impression (Figs 26 and 27), and a master cast was poured in improved dental stone (Jade Stone, Whip Mix Corporation, Louisville, KY, USA; Fig 28).

Titanium caps were then positioned onto the abutment analogs, sandblasted, and primed (Alloy Primer, Kuraray, Tokyo, Japan) to improve the seal and retention to the denture base. The denture base was then rebased (PalaXpress, Heraeus Kulzer, Hanau, Germany), incorporating the Locator attachments, and finished (Figs 29 and 30).

The denture was then verified for tissue adaptation and the alignment of the attachments to the abutments (Fig 31). The occlusal and vertical relationships were verified with minor adjustments made through a clinical remounting process. The patient's ability to remove the prosthesis without difficulty was confirmed, and post-treatment oral hygiene instruction was provided.

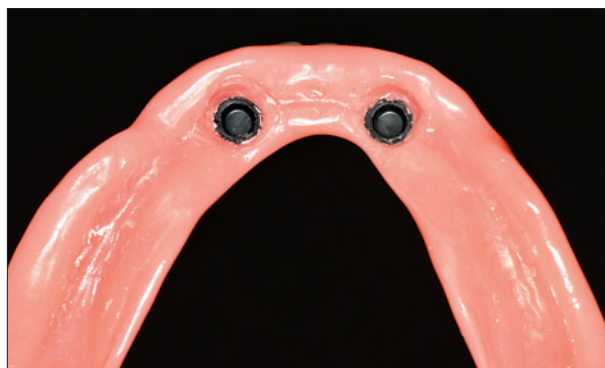


Fig 30 Tissue side of the denture with Locator titanium caps incorporated.



Fig 31 Verifying the seating of the denture.

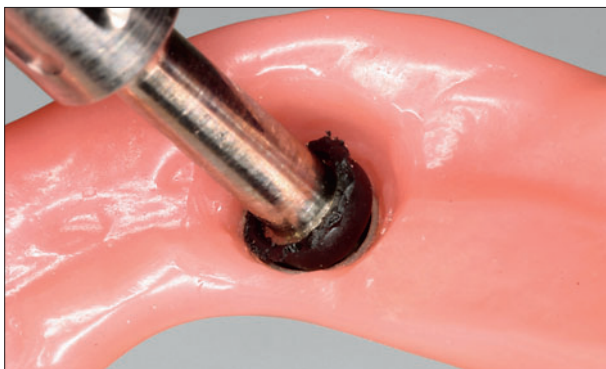


Fig 32 Removing the black processing blank.



Fig 33 Color-coded attachments.

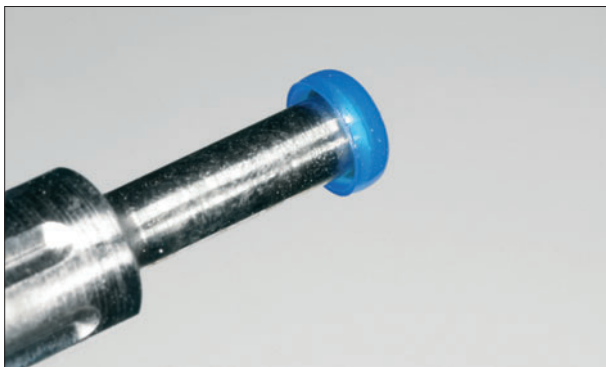


Fig 34 A blue attachment was selected.

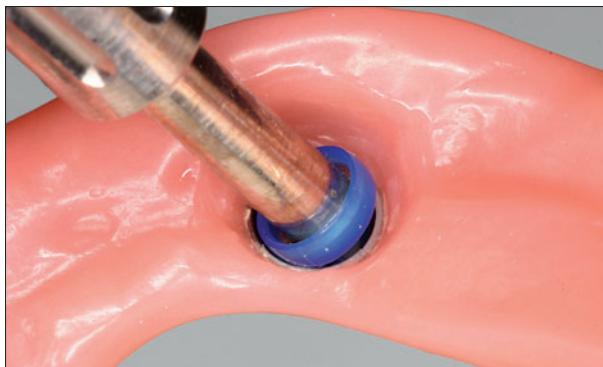


Fig 35 Integrating the blue attachment into the denture.

Follow-up assessments were undertaken after 48 hours and 1 week. Minor adjustments to the denture base were made as indicated. At the 1-week follow-up, the black processing blanks were removed (Fig 32) and replaced with the blue (6.7 N) attachments using a locator core tool (Figs 33 to 37).

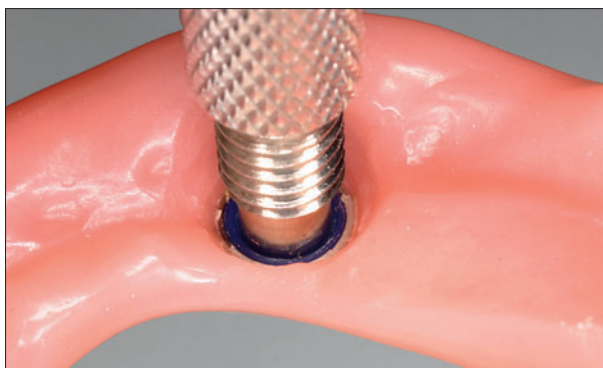


Fig 36 Locator core tool used to secure the blue attachment in place.



Fig 37 Both Locator attachments in their final positions.



Fig 1a Initial radiographic exam.



Fig 1b Maxillary wax-up relationship.



Fig 1c Maxillary wax-up.



Fig 1d Flangeless wax-up, anterior view.



Fig 1e Esthetic planning.



Fig 1f Set-up/ridge.



Figs 1a-g Diagnostic wax-up.

Special attention was given to adjusting the prosthetic acrylic-resin teeth to the cast without waxing up a vestibular flange to establish the appropriate emergence profile for a fixed rehabilitation (Figs 1c-d). The palatal and lingual aspects were created in the same way as for a complete denture (support and retention of prosthetic teeth; Figs 1b-c). This diagnostic wax-up was then used to assess the clinical occlusion, esthetic parameters, and the relationship between the teeth and the alveolar ridge (the emergence profile; Figs 1d-g). Furthermore, before proceeding with the treatment, patient approval was obtained, especially with regard to esthetic aspects.



Fig 2a Maxillary surgical template.

## Immediate Implant Loading

After assessing extraoral and intraoral parameters, the diagnostic wax-up was duplicated for the fabrication of a provisional template and a surgical guide (Figs 2a-f). This replication of a provisional template and a surgical guide from the diagnostic wax-up allowed the retrieval of pertinent information at each stage of the treatment.



Fig 2b Mandibular surgical template.

Figs 2a-f Surgical and provisional templates duplicated from the diagnostic wax-up.



Fig 2c Maxillary provisional template.



Fig 2d Mandibular provisional template.



Fig 2e Upper provisional without buccal flanges.



Fig 2f Lower provisional without buccal flanges.