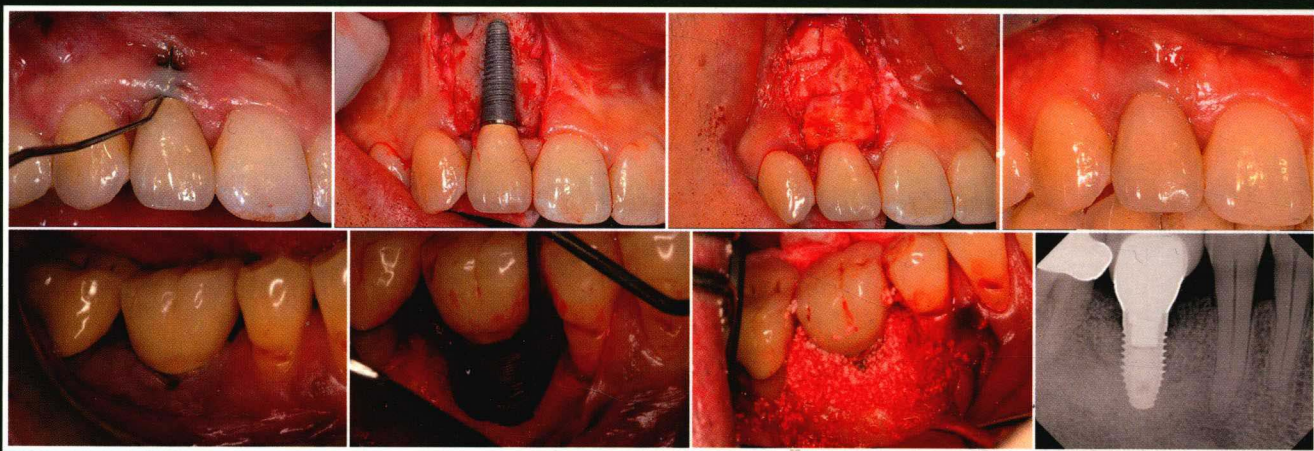


SECOND EDITION

Dental Implant Complications

Etiology, Prevention, and Treatment



Edited by **Stuart J. Froum**

WILEY Blackwell

Dental Implant Complications

Etiology, Prevention, and Treatment

Second Edition

Edited by

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Foreword

The timely publication of *Dental Implant Complications*, second edition, presents significant, interesting new information to the clinician.

Osseointegrated implants introduced predictability for patient care as an alternative to traditional dental therapies. The early evidence, by Brånemark and his team, provided implant-supported prostheses for edentulous patients and the contemporary scope of treatment has expanded to the partially dentate patient, opening the door to innovation.

The dental community at large explored the possibilities for expansion, including implants placed in extraction wounds, localized enhancement of the atrophic alveolar ridge, construction of bone in the maxillary sinus, and immediate loading of the prosthesis. Of special interest has been the concept of satisfying the patient's esthetic demands by extending the prostheses subgingivally, thus introducing the term "peri-implantitis."

On examination of the curricula of recent symposia, precious time is devoted to the management of these complications. There is a collision of ideologic thoughts as to whether the etiology is mechanical force of the prostheses or inflammation relative to bacterial infection, but nevertheless, it poses a major inconvenience.

This expansive textbook is a concerted effort to explore local and systemic factors that may be responsible for complications encountered in implant therapy. It over-views the myriad of therapies that have been described and provides insight into their value. It immediately becomes evident that there is not one etiology and there is not one common solution. The editor, Stuart J. Froum, has engaged surgical and prosthetic experts to direct the reader to a solution to their patients' clinical problems.

The appropriate therapeutic diagnosis generally sets the tone for longevity. The advent of digital dentistry provides an opportunity to avoid many mechanical issues, but routine success depends upon the basic tenet of the implant residing within the boundaries of bone. Three-dimensional radiographs provide informa-

tion before initiating therapy and navigational systems allow for successful accomplishment of this goal. One of the most serious complications one may encounter is an anatomic obstruction such as violating the inferior alveolar nerve or the maxillary sinus. Other diagnostic complications involve systemic disorders, medications, and an accurate medical history of the patient. All of these topics are presented in depth here. This edition emphasizes that it is far better to prevent complications than to treat them.

Surgical complications begin with the decision of whether to save the tooth or place an implant. If implants were 100% successful, there would be no need for this text; however, a careful reader can prepare themselves to diagnose and to surgically place an implant where indicated, in the proper position to avoid complications.

One must separate the patient population into a cohort of individuals with a tooth or teeth missing without the inconvenience of periodontal disease. Replacing congenitally missing teeth or a tooth lost to caries or trauma allows greater leeway with the engagement of the gingiva. A second cohort of periodontally compromised patients have already demonstrated their susceptibility to inflammation in the oral cavity and the implant-restored area must be cleansable by the patient and the hygienist. This can become an etiologic factor in the esthetic area which is very difficult to resolve.

Another esthetic issue engaged in this text is how to manage two adjacent implants. Once again, the text offers the reader the opportunity to plan appropriate treatment and prevent complications. There is a sincere effort to discuss advanced osteogenic surgical procedures and to consider appropriate biologics.

The advantages to patients of placing immediate implants in extraction wounds, of immediate loading with provisional prostheses and occasionally with a final prosthesis are obvious. Fewer procedures, considerably fewer office visits, and reduced financial commitment accompany this activity. This text underlines the

possibility of complications with advanced procedures and guides the reader through planning and execution to the treatment of the various complications if and when they occur.

There is a complete discussion of prosthetic complications and, once again, their prevention by diagnosis, thoughtful treatment planning, and maintenance of the result.

The consequences of inflammation are married to the need for a serious maintenance program for the oral cavity in concert with both the patient and the healthcare

provider. All of these issues are discussed clearly in the text. Every dental office participating in implant dentistry should have this text in their library and become familiar with its wisdom before, during, and after treatment. It is a fabulously complete work and I congratulate the editor, Stuart Froum, and contributors.

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Introduction

This is the second edition of *Dental Implant Complications: Etiology, Prevention, and Treatment*. As I wrote 5 years ago in the Introduction to the first edition, this book is written for any dentist placing and/or restoring implants. Its aim is to identify common and uncommon implant complications, discuss their etiology, and propose methods of prevention. Our hope is that by doing this the clinician will be able to assess the risks of and avoid, or reduce, many of the complications being seen today. Moreover, the treatments of these complications are discussed in detail, so if the reader experiences a similar or related problem they will be familiar with possible treatment options. Often a minor (and more often a major) complication can result in anguish for the patient, associated with pain, loss of income, and loss of time, and for the clinician loss of a patient and/or referral and possible legal problems.

The introduction of the concept of osseointegrated endosseous implants to the field of dentistry in the 1980s resulted in a paradigm shift that affected almost every aspect of dental care. Diagnosis and treatment planning now included an implant option for patients and clinicians alike. The inclusion of implant therapy became part of the undergraduate and graduate dental school curriculum. A significant part of every dental meeting included new research, new equipment, new techniques, and new products related to implant therapy. Technology for implant therapy, such as diagnostic software, computer tomography (CT), cone beam CT (CBCT) scans, three-dimensional printing, and computer-aided systems to place and restore implants, made the implant option easier and more predictable. Associated products, including bone grafts, bone substitutes, membrane barriers, machines to measure implant stability, Piezosurgery®, laser systems, and computer-generated guides, provided dentists with methods to expedite the placement of implants. New protocols for implant placement and restoration shortened the time required for replacement of an extracted or missing tooth with an implant-supported restoration.

However, as more dentists and patients chose the implant option, more complications and adverse events began to be recorded. Some of these complications were minor while others resulted in damage to the patient and failure of treatment. The aim of this book is to help both the novice and experienced implant clinician to avoid these problems and, if they occur, to teach the clinician how to treat or when to refer these complications for treatment.

Since the publication of the first edition, the number of dentists placing and restoring implants has increased significantly. According to the statistics from an independent research company (Millennium Research Group 2012), the number of implants sold in the United States alone in 2014 has increased by 680 000 when compared with 2010 (the year of the first edition of this book was published). According to another independent research group (i Data Research INC, 2013) the sales of implants, again in the United States alone, will increase over 5% per year from 2015 to 2017. Although the number of complications has not been calculated, more implants, more dentists placing them, and use in more complicated cases will inevitably lead to an increasing number and complexity of implant complications. Up to date knowledge is needed to determine their etiology, prevention, and treatment.

For the sake of organization, this book, like the previous edition, has been divided into implant complications associated with the diagnosis, treatment planning, placement, restoration, and maintenance of implants. While this division is arbitrary, and many complications have multifactorial etiology, the intention of this book is to help identify the most common implant complications. Each chapter presents information that will familiarize the clinician with these complications and hopefully decrease the number and extent of future complications. Moreover, the management of these complications will be described in depth in an attempt to provide guidance and direction to the clinician when he or she experiences any of these problems.

Each chapter will also provide a detailed analysis of the etiology, prevention, and treatment of specific complications. This second edition includes five new chapters reflecting the increase in the number and complexity of implant complications. In addition, the 25 original chapters have all been revised and updated to present the latest information on complications that have been diagnosed and treated by some of the most experienced dentists in practice and academics. Chapters and cases have been added, with 16 additional experts sharing their knowledge and expertise.

The reader will find that some chapters repeat information previously discussed relating to different complications (e.g., three-dimensional implant placement, use of CT or CB scans for implant planning, prosthetic solutions to implant malposition, esthetic complications, and requirements for a successful implant restoration). However, this repetition, rather than being viewed as redundant, should be considered basic to the prevention or management of several different types of complications. Moreover, the different authors present this information from various aspects of their clinical experience. This results in a more comprehensive understanding of a problem and actually increases knowledge of treatment options.

Also included are chapters discussing complications that may occur from various site development procedures designed to augment hard or soft tissue before or in conjunction with implant placement. Each chapter concludes with "Take-home hints," serving as helpful reminders in avoiding or treating the complications discussed in the chapter. In addition, there is a chapter on "Medicolegal issues related to implant complications," discussing implant procedures relative to the law. Following the format of the book, this chapter discusses methods of avoiding legal ramifications of implant complications and discusses what to do if a clinician is involved in legal action.

Lastly, two chapters on "Management of implant complications by the experts" have been included, containing case reports by a number of experienced clinicians who review a specific complication, describe how they treated it, and discuss how they may have prevented it from occurring given similar circumstances. Each chapter should serve as a practical clinical guide.

To quote Barry Le Patner: "Good judgment comes from experience, and experience comes from bad judgment." It is hoped that the reader will gain good judgment from the experience of the contributing authors of this book.

Stuart J. Froum DDS

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