Book Reviews



Dental Applications of Computerized Tomography: Surgical Planning for Implant Placement

Edited by Stephen L.G. Rothman, MD. Quintessence Publishing Co, Inc., Carol Stream, IL, 1998: ISBN 0-86715-338-5. (246 pages; 341 CT images, color images, and illustrations; Price \$110, hard cover)

Dr. Stephen L.G. Rothman provides the reader with a thorough review of the applications of computerized tomography (CT) in dental implant presurgical planning. Appropriate for surgeons, radiologists, restorative dentists, orthodontists, prosthodontists, and other dental specialists involved with dental implants, the book is divided into nine chapters, each with many CT images and figures.

Chapter 1 reviews the historical perspective of different imaging modalities in dental implantology. The use of intraoral, occlusal, and panoramic radiographs as well as conventional tomograms are described.

Chapter 2 reviews the techniques for CT of the jaws beginning with a brief historical overview, and progressing to scanner selection, patient preparation, scanning technique, and multiplanar reformation. The reformatting process transforms the raw data obtained from the CT scan into clinically useful axial, cross-sectional, and panoramic images. Various figures and images from the DentaScan and other reformatting software are used to illustrate this process. Dental artifact and its impact on the CT images are investigated as well as presenting techniques for the use of intraoral stents.

Chapter 3 deals specifically with CT of the mandible. The normal anatomy of the mandible and its CT evaluation is thoroughly discussed with many figures showing anatomical structures of vital importance in implant dentistry. The most important factors considered include: (a) height of alveolar bone; (b) buccolingual dimension of the alveolar ridge; (c) contour of the ridge; (d) density of bone; (e) position of inferior alveolar nerve and mental foramen.

Chapter 4 reviews CT of the maxilla. The normal anatomy and important structures of the maxilla are discussed and illustrated with various CT images and figures. The anatomic parameters of concern with implant surgery in the maxilla include the maxillary sinus and incisive fossa and canals.

Chapter 5 reviews tomographic evaluation of the need for alveolar ridge enhancement and the anatomy of already enhanced arches. A variety of hard tissue ridge augmentation techniques are discussed, including interpositional and onlay grafts, inferior bone grafts, segmental reconstruction, and sinus lift procedures.

Chapter 6 reviews the use of CT imaging in patients who have already had implants placed. The evaluation of osseointegrated implants, failed implants, and symptomatic implants are discussed. Evaluation of blade implants, subperiosteal implants, and other metallic surgical hardware are also reviewed.

Chapter 7 reviews implant surgical planning with the Sim/Plant software program. This interactive dental CT software allows the surgeon and restorative dentist to use the CT images to treatment plan the exact placement of the implant fixture and restorative components with software displaying the position of available bone and vital structures in three dimensions. The clinician is able to view axial images, panoramic images, and cross-sectional images of the areas of interest and to make accurate measurements directly on the images of interest. The ability to graphically place implants in optimum alignment allows precise treatment planning. There have been great improvements in the Sim/Plant software and others since this text was published, making it much more user friendly and giving the user more ability to manipulate the images.

Chapter 8 reviews the non-implant uses for dental CT. The accuracy provided by dental CT makes it ideal for evaluation of many pathologic conditions affecting the jaws. Several conditions that may benefit from dental CT are discussed, including: (a) impacted and unerrupted teeth; (b) odontogenic cysts; (c) nonodontogenic cysts; (d) lingual mandibular bony defects; (e) mucoceles and cystic lesions; (f) fibrous dysplasia and ossifying fibroma; (g) carcinoma; and (h) osteomyelitis. Each of the above conditions is nicely illustrated with CT images.

The last chapter brings many of the previous topics together and reviews the use of prosthesisgenerated CT information for diagnosis and surgical treatment planning. In this lengthy chapter, the authors discuss facial esthetics, the impact of pathologic changes on the residual ridge, classification of residual ridge deformity, determination of the optimal final tooth position, analvsis for implant placement, analysis for residual ridge augmentation, prosthetic designs, and several clinical cases. A scientific-based method for addressing complications is presented. Several flowcharts guide the clinician in identifying the problem, determining the objectives, determining the strength-weaknesses, opportunity-threat analysis, development of a plan, execution, and the tracking of results.

This book offers an overview of the many uses of CT in the field of oral implantology. With the increased importance and popularity of dental implants, an understanding of the valuable diagnostic and treatment planning information available from dental CT is critical. Not every dental implant case may require the level of information provided by a dental CT, but it should be given consideration if it will be clinically beneficial. Because this text was published in 1998, some of the information is outdated. Dental CT software and hardware have continued to improve, making it much more user friendly, providing the user with more information and the ability to manipulate the images to optimize treatment planning. With the advent of cone beam CT, the size of the machines and the amount of radiation exposure to the patient has decreased and has made it possible for practices to offer this service to their patients at the dental office, making it more convenient for both the patient and provider.

With the abundance of dental CT images provided in this text, the reader should feel fairly comfortable in interpreting CT images of their own patients by the end of the book. The organization of this book allows even the novice to have a good foundation in the dental applications of CT. This book would be ideal for anyone involved in the dental implant team, including the surgeon, the restoring dentist, dental specialists, and the radiologist or technologist.

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