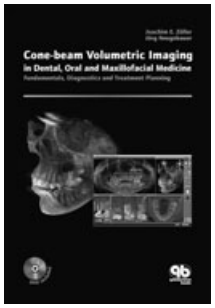
Book Review

Cone-Beam Volumetric Imaging in Dental, Oral, and Maxillofacial Medicine: Fundamentals, Diagnostics, and Treatment Planning



By Joachim E. Zoller and Jorg Neugebauer. Quintessence Publishing Co. Ltd., London, 2008: ISBN-13: 978-1-850971-68-9 (228 pages; 383 mostly color and radiographic images; price $218.00).

This book is intended to introduce readers to the enhancements 3D radiological imaging can offer dental practice, with an emphasis on cone-beam volumetric imaging (CBVI). The text includes sections of technology (2 chapters), diagnostics (11 chapters), and treatment planning (3 chapters). In addition, methods for using 3D imaging to complement the esthetic outcomes of extensive oral-maxillofacial procedures using minimally invasive surgical techniques are detailed. A significant benefit of CBVI-CT scans of the cranium is that these scans generate lower levels of radiation exposure to the patient than conventional CTs. The GALILEOS implant-planning software, based on the GALAXIS 3D viewer software, is primarily used to present the text's information. Included with this book is a DVD with a variety of GALILEOS images and video intended to demonstrate anatomic and pathological structures. Each chapter concludes with a reference list.

A technological review is the basis for the brief, first section of the text. This review, although at times difficult to follow, is a comprehensive review of CT technology, CBVI technology, and CBVI reconstruction methods. The section includes discussions of radiation dosage, 2D and 3D visualization of the data, and explanations of effective use of data visualization in the three orthogonal planes. The remainder of this section familiarizes the reader with image quality and minimum requirements for the quality of CBVI images. Also included is a requirements list for CBVI in dental practice to include image features, image detail, and critical image elements.

The second section of the book, "Diagnostics," uses CBVI images to provide a basic review of a wide variety of dental anatomic and dental pathologic conditions as observed using 3D imaging. Dental anomalies, impacted teeth, periodontal disease, dental caries, and orthodontic malocclusions are included. The section continues with images of traumatic factures, bony lesions, craniofacial malformations, and diseases of the maxillary sinus, salivary glands, and TMJ. Unfortunately, the 2D and 3D projection images used are too small to allow the reader to see several of the dental conditions described in the text. Also, many of the image legends do not adequately describe, the important information observable on the CBVI images. Most diagnostic sections of the atlas conclude with a summation that assists the reader in determining if CBVI provides superior diagnostic results as compared to conventional radiographic techniques.

The final section of the book is devoted to implant therapy and maxillofacial orthognathic treatment planning enhanced by CBVI technology. The authors advocate that spatially accurate 3D diagnostics is preferred over conventional tomogram because conventional tomograms enlarge anatomical structures in a nonuniform manner by 25% to 30%. Conventional panoramic tomographs limit the evaluation of anatomical structures in the horizontal and vertical directions, a situation improved with 3D technology. In addition, the presurgical evaluation of existing bone quality and quantity is enhanced. In regards to planning dental implant therapy, CBVI is recommended to improve the selection of drill types and implant-site augmentation requirements, as well as to reduce the complication rate of recommended therapies.

Finally, a DVD included with the book is loaded with selected files to view the capabilities of GALILEOS to plan implant therapy. The disk also includes 54 video files to allow the visualization of the anatomic, pathologic, and developmental conditions described in the book. Unfortunately, the text and DVD include minimal instruction on how to use the DVD. When the DVD was loaded, two error messages were reported. Also, the video files are not labeled in English, and the audio files were not readily available to enhance the visuals provided in the video files.

For both the new and seasoned clinician, this book provides an overview of how CBVI can enhance clinical practice diagnosis and surgical treatment planning; however, implementation of the breadth of information presented in the text will not make the provider clinically competent in the use of CBVI. This text opens the door to a technology that is quickly becoming the standard of care in dental practice, and the authors deserve credit for showcasing the technology. A more in-depth reference guide and experience with specific hardware and software applications are necessary to become clinically competent in this technology.

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