ABSTRACTS & REVIEWS
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RADIOPHOMATIC CEHAFALOMETRY: FROM BASICS TO 3-D IMAGING. SECOND EDITION.


For the past 2 decades, Alex Jacobson has provided orthodontists with the quintessential book for understanding and applying cephalometric data to their orthodontic diagnoses and treatment plans. This new edition, co-edited with Richard Jacobson, continues that service with important revisions that bring it completely up-to-date.

Drs. Jacobson have wisely continued to include chapters by eminent specialists, such as Coenraad Moorees, Richard Weems, Page Caufield, Scott McClure, André Ferreira, James Vaden, Herb Klontz, Lionel Sadowsky, Joseph Ghafari, Leslie Johnston, Shane Langley, Christos Vlachos, David Sarver, Mark Johnston, William Harrell, David Hatcher, and James Mah. These individuals describe their concepts in precise terms that leave little to the imagination.

Most of the chapters from Jacobson’s previous cephalometric publications continue in this new edition. However, as befits the era, new chapters devoted to 3-dimensional cephalometry offer readers valuable and current information regarding these new additions to the cephalometric armamentarium. Another new chapter by Ghafari addresses the subject of posteroanterior cephalometry, which has new relevance in this time of 3-dimensional analysis, diagnosis, and treatment planning.

Rather than include printed cephalometric templates as in previous publications, this new book attaches them to a CD-ROM that also contains manual tracing templates, digital tracing templates, and video clips that demonstrate 3-dimensional technology. A superb teaching and learning tool!

Previous orthodontic texts that once offered the profession valuable information have eventually become passé and have, understandably, passed from the scene and our memories. For the past 2 decades, Alex Jacobson has provided orthodontists with the quintessential book for understanding and applying cephalometric data to their orthodontic diagnoses and treatment plans. This new edition, co-edited with Richard Jacobson, continues that service with important revisions that bring it completely up-to-date.

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Previous orthodontic texts that once offered the profession valuable information have eventually become passé and have, understandably, passed from the scene and our memories. Fortunately for us, Jacobson has resisted the temptation to let his knowledge lie fallow and offers us this revised edition that includes significant advancements and continues to merit our close attention. This is a “must” for orthodontic residents and faculty. –Larry White

MICROIMPLANTS IN ORTHODONTICS


At last, the long-awaited comprehensive reference on orthodontic temporary anchorage devices (TADs) has arrived. Developed and used by our Asian colleagues for the past 9 years, microimplants/miniscrews/mini-implants are now entering the US orthodontic arena. These devices are a handy addition to the orthodontist’s armamentarium. This book, authored by prominent Korean orthodontists who are the forerunners in the field of TADs, provides a comprehensive resource on microimplants and their clinical applications.

Point of clarification: This book uses the term microimplant to describe TADs that are 1.9 mm or less in diameter while the term miniscrew is used to describe those that are 2.0 mm or greater in diameter. Many terms and names for these devices have been circulating in the market; the authors do a good job of defining the terminology used in their text to avoid the reader’s confusion.

It must also be remembered that the authors invented a particular microimplant anchorage system—Dentos Absoanchor—which was used in most of their cases. The authors tried to eliminate any bias in their text by including other systems, as well. This may bring out the critical thinker in each of us, but it must be kept in mind that although the dimensions and features of each TAD system may vary, the underlying biomechanical principles for their clinical use remain the same.

The authors begin by taking us on a remarkable journey as they outline the evolution of their skeletal anchorage system. The chapters that follow provide step-by-step instructions, from selecting the appropriate size to the proper placement of microimplants. The different indications for use in each area of the oral cavity are elaborated upon, along with the ideal dimensions for the TADs in each site. Subsequently, the different methods of microimplant placement are defined and described in detail. Several complications and frequently encountered problems are likewise specified and recommendations made to overcome them. The biomechanics of diverse tooth movements with the use of microimplants is then discussed.

A myriad of case reports are shown in Chapter 6 to illustrate the different clinical applications of the microimplant. The sample cases vary from complex skeletal dysmorphologies to various dental discrepancies. Case examples for Class I, II, and III extraction and nonextraction treatment, anterior open-bite cases, deep-bite cases, lingual orthodontics, occlusal plane canting, different molar movements, etc., are all fully illustrated.

The best feature of this book is the inclusion of hundreds of color illustrations that keep the reader engaged in learning. Exploring the diverse clinical applications of microimplants only deepened my appreciation for the many outstanding outcomes.
In the field of dentistry, we learn from long-term stability data and clinical errors. This text aptly ends with a few pages of data regarding stability and failure rates of temporary anchorage devices. All of the studies presented involved numerous variables. The conclusion was that although the failure rates are generally low, 100% success is not yet achievable.

The field of orthodontics is entering a significant paradigm shift in treatment modalities with the advent of temporary anchorage devices. Indeed, this book makes its debut at an opportune time. Reinforced by the editing of James A. McNamara, this surely is a must-have for every orthodontist! –Maria Therese S. Galang

ROENTGEN-CEPHALOMETRIC STANDARDS FOR A SWEDISH POPULATION. A LONGITUDINAL STUDY BETWEEN THE AGES OF 5 AND 31 YEARS

Numerous differences in dental, skeletal, and soft tissue patterns exist among ethnic and gender groups. In the Swedish population, few studies have examined normative cephalometric data in the early juvenile to adult populations. The purpose of this study was to establish age- and gender-specific normative data for a Swedish population between the ages of 5 and 31 years. Out of 2,457 children screened in 2 Swedish cities, only 469 children fulfilled the normative criteria of an Angle Class I molar/canine relationship, normal transverse occlusion, overjet and overbite from 1 to 3 mm, no congenitally missing teeth or crowding, straight profile without any obvious asymmetries, and no history of orthodontic treatment. Lateral cephalograms and body height measurements were collected and digitized from 2 cities in Sweden, evaluating 40 cephalometric measurements at ages 5, 7, 10, 13, 16, 19, and 31 years. Student t test comparing cephalometric variables from the 2 cities showed no significant differences. Results demonstrated growth acceleration between the ages of 13 and 16, with facial growth in males coinciding with body height but female facial growth spur occurring after that of body height. The maxilla increased in height by twice that of the length due to sutural growth and remodeling. The mandibular growth ended primarily around age 19, but was still present at age 31 in some instances. Overall, males exhibited larger linear cephalometric measurements than females, but angular measurements between the genders showed no statistical differences. Normative data established by this study help orthodontists diagnose, treatment plan, and execute retention in different ages and genders of the Swedish population. –Isaac Yue

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LONG-TERM EFFICACY OF REVERSE-PULL HEADGEAR THERAPY

The objective of this study was to add to the data for long-term reverse-pull headgear (RPHG) outcomes and further explore possible variables that could be predictors of long-term failure. Cephalometric radiographs of 41 children with Class III malocclusion treated with RPHG (face mask) were evaluated before and immediately after treatment; at 5 years posttreatment; and, for 18 patients, at 10 years posttreatment. Patients were assigned to success or failure groups according to positive or negative overjet at the longest available recall. The results show that 75% of the patients maintained positive overjet, whereas 25% outgrew the correction. In a stepwise discriminant analysis, a large mandibular and vertical positioning of the maxilla and mandible so that mandibular growth would be projected more horizontally were the major indicators of unfavorable later mandibular growth. Patients who experienced downward-backward rotation of the mandible during RPHG treatment were more likely to be categorized in the failure group. The age at which treatment began had no effect on long-term success and failure for patients younger than 10 years, but the percentage of successful treatment decreased after that age. In conclusion, when RPHG treatment is used for all but the most obviously prognathic children to correct anterior crossbite in the early mixed dentition, positive overjet is maintained long-term in 70% to 75% of cases, whereas 25% to 30% of cases relapse into reverse overjet mainly because of increased horizontally directed and often late mandibular growth. Up to age 10, the time at which RPHG treatment began does not appear to be a major factor in long-term success in maintaining positive overjet. –Ahmet Keles

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PERIODONTAL STATUS OF MANDIBULAR CENTRAL INCISORS AFTER ORTHODONTIC PROCEDURES IN ADULTS

Some animal and human studies have shown that periodontal recession occurs after incisor proclination, but other authors disagree. The purpose of this study was to assess the periodontal status of mandibular central incisors that were proclined during orthodontic treatment. The sample comprised 34 adults who had completed treatment over periods of 7 months to 3 years 11 months. The proclination and vertical movement of these teeth were analyzed by 6 measurements from lateral cephalometric radiographs taken before and after treatment. The thickness and height of the symphysis were recorded from pretreatment lateral cephalometric films. Crowding was determined based on the irregularity index from the initial cast. The following periodontal clinical parameters were assessed: plaque and gingival bleeding indexes, probing pocket depth, clinical levels of attachment, and recession of selected teeth and of the mandibular central incisors. The height of the keratinized tissue and the thickness of the facial gingival margin of these incisors were also measured. The Pearson and Spearman correlation analyses, the Fisher exact test, and the Kruskal-Wallis test were applied. Statistical analyses showed no correlation between recession and the plaque and gingival bleeding indexes, probing pocket depth, and total quantity of labial movement (P > .05). Recession was negatively correlated with keratinized gingival height and thickness of the facial gingival margin on the mandibular central incisors. Final inclination (>95 degrees) and free gingival-margin thickness (>0.5 mm) showed greater and more severe recession on the mandibular central incisors. Nevertheless, when comparing thickness to the final inclination, thickness had greater relevance to recession. –Ahmet Keles

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LONG-TERM FOLLOW-UP OF ORTHODONTICALLY TREATED DEEP BITE PATIENTS


The aim of this study was to evaluate the long-term stability of corrected deep bite and mandibular anterior crowding in a sample of 62 subjects (30 patients and 32 controls). The patients began treatment at a mean age of 12.2 years (standard deviation, 1.56 years). The treatment consisted of nonextraction and fixed appliances in 23 subjects and functional appliances in 7 subjects. The treatment group was compared with the control group with normal molar occlusion, normal overjet and overbite, no crowding, and without orthodontic treatment need. The registrations were made on 4 occasions: before treatment (T1), after treatment (T2), and at 2 long-term follow-up visits (T3 and T4). Four registrations were also made in the control group. All measurements were undertaken on plaster casts and lateral cephalograms.

Treatment was found to have normalized the overbite and overjet and to have eliminated the space deficiency in the mandibular anterior region. At T4, there was a minor relapse in overbite in the treatment group (mean, 0.8 mm). In the control group, the overbite underwent reverse development (bite opening by 0.7 mm) during the same period. The available mandibular incisor space, however, was –0.9 mm in the treatment group and –1.8 mm in the control group. The long-term stability of the treatment results was good.

Tissue Engineering of a Periodontal Ligament–Alveolar Bone Graft Construct


This paper reports on a 2-phase study of a novel membrane-scaffold graft construct, its ability to support periodontal ligament fibroblast (PDLF) and alveolar osteoblast (AO) growth in vitro, and its use for tissue engineering a PDL-AO interface in vivo. Human PDLFs were seeded onto perforated poly(e-caprolactone) membranes (n = 30) at 78,000 cells/cm²; human AOs were seeded on poly (e-caprolactone) scaffolds (n = 30) with fibrin glue at 625,000 cells/cm³. Cell attachment, morphology, viability, and metabolic activity were monitored for 3 weeks in vitro. Subsequently, cell-seeded membrane-scaffold constructs (experimental group, n = 9) and nonseeded constructs (control group, n = 4) assembled with fibrin glue were implanted subcutaneously into 7 athymic mice for 4 weeks. The results show that PDLFs formed confluent layers on membranes, whereas AOs produced mineralized matrices within scaffolds upon osteoinduction in vitro. Well-vascularized tissue formation was observed after implantation. Integration at the membrane-scaffold interface was enhanced in the experimental group. Type I collagen, type III collagen, fibronectin, and vitronectin were found adjacent to membranes and within constructs. Bone sialoprotein expression and bone formation were undetectable. Membrane perforation and scaffold porosity facilitated tissue integration and vascularization at the construct-recipient site. However, the interaction between PDLF and AO could have interfered with osteogenesis at the interface of soft and mineralizing tissues. In conclusion, both matrices supported PDLF and AO attachment and proliferation in vitro. The membrane-scaffold construct facilitated tissue growth and vascularization while providing strength and form in vivo.

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