

สำนักหอสมุด มหาวิทยาลัยเชียงใหม่



3 0001 01232589 2

SECOND EDITION

# Practical Advanced Periodontal Surgery

Edited by Serge Dibart



DENTISTRY LIBRARY CMU

WILEY Blackwell

# Contents

|                                                                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| List of Contributors                                                                                                                               | xii  | Post-Operative Care 41<br>Contraindications for Piezocision 42<br>Potential Complications 42                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Acknowledgments                                                                                                                                    | xiii |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| About the Companion Website                                                                                                                        | xv   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Introduction                                                                                                                                       | 1    | <b>5. The Contribution of Periodontics to Endodontic Therapy: The Surgical Management of Periradicular Periodontitis</b> 43<br><i>Mani Moulazadeh</i><br>History and Evolution 43<br>Tooth Conservation Versus Implants 43<br>Treatment of Failed Root Canal Therapy 44<br>Rationale for Endodontic Surgery 44<br>Indications for Endodontic Surgery 44<br>Contraindications for Endodontic Surgery 46<br>Types of Endodontic Surgery 48<br>Periradicular Surgery 51<br>Phases of Apicoectomy and Surgical Technique 52<br>Recall 60 |
| <b>Conscious IV Sedation Utilizing Midazolam</b>                                                                                                   | 3    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Jess Liu                                                                                                                                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Introduction 3                                                                                                                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Midazolam (Versed) 3                                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Armamentarium 4                                                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Steps in IV Sedation 4                                                                                                                             |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>2. Bone Physiology and Metabolism</b>                                                                                                           | 11   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Jean-Pierre Dibart                                                                                                                                 |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Bone Composition 11                                                                                                                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Bone Types 11                                                                                                                                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Bone Formation 11                                                                                                                                  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Bone Density Measuring Techniques 14                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Implications for Dental Treatments 15                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>3. Anatomy of the Dental/Alveolar Structures and Wound Healing</b>                                                                              | 19   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Albert Price                                                                                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Anatomic Review (Emphasis on Vascular Supply) 19                                                                                                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Vascular Supply Macro and Micro 19                                                                                                                 |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Blood Supply Within the Alveolar and Basal Bone of the Dental Arches 21                                                                            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Microarchitecture of the Bone/Tooth                                                                                                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Relationship and the Interface of Soft and Hard Connective Tissues 21                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Anatomy and Vascular Supply of the Investing Soft Connective Tissues 25                                                                            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Cementum 28                                                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Antotomy and Vascular Supply of the Epithelial Structures 28                                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The Wound-Healing Process 29                                                                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>4. Piezocision™ Assisted Orthodontics in Everyday Practice</b>                                                                                  | 35   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Serge Dibart, Elif Keser, and Donald Nelson                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Introduction 35                                                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| The Technique 35                                                                                                                                   |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Computer Guided Piezocision-Orthodontics 35                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Dynamically Guided Piezocision 37                                                                                                                  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Piezocision Assisted Orthodontics With Clear Aligners 38                                                                                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Incorporating Piezocision in Multidisciplinary Treatment 39                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Post-Operative Care 41                                                                                                                             |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Contraindications for Piezocision 42                                                                                                               |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Potential Complications 42                                                                                                                         |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>5. The Contribution of Periodontics to Endodontic Therapy: The Surgical Management of Periradicular Periodontitis</b>                           | 43   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <i>Mani Moulazadeh</i>                                                                                                                             |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| History and Evolution 43                                                                                                                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Tooth Conservation Versus Implants 43                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Treatment of Failed Root Canal Therapy 44                                                                                                          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Rationale for Endodontic Surgery 44                                                                                                                |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Indications for Endodontic Surgery 44                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Contraindications for Endodontic Surgery 46                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Types of Endodontic Surgery 48                                                                                                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Periradicular Surgery 51                                                                                                                           |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Phases of Apicoectomy and Surgical Technique 52                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Recall 60                                                                                                                                          |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>6. The Contribution of Periodontics to Prosthodontics: Treatment Planning of Patients Requiring Combined Periodontal and Prosthodontic Care</b> | 61   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Haneen N. Bokhadoor, Nawaf J. Al-Dousari, and Steven Morgano                                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Introduction 61                                                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Diagnostic Phase (Data Collection) 61                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Treatment-Planning Phase 63                                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Final Prognosis 63                                                                                                                                 |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Conclusion 105                                                                                                                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>7. The Contribution of Periodontics to the Correction of Vertical Alveolar Ridge Deficiencies</b>                                               | 107  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Serge Dibart                                                                                                                                       |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Alveolar Distraction Osteogenesis Surgery 107                                                                                                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>8. Papillary Construction After Dental Implant Therapy</b>                                                                                      | 117  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Peyman Shahidi, Serge Dibart, and Yun Po Zhang                                                                                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| History 117                                                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Indications 117                                                                                                                                    |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Contraindications 117                                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Armamentarium 117                                                                                                                                  |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Technique 117                                                                                                                                      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Postoperative Instructions 119                                                                                                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Surgical Indexing 119                                                                                                                              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Possible Complications 119                                                                                                                         |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Healing 119                                                                                                                                        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                             |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>9. Dental Implant Placement Including the Use of Short Implants</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>121</b>                                                                                                                                                                                                                                                                                                                  | Squamous Cell Carcinoma 150<br>Verrucous Carcinoma 151<br>Metastatic Disease 151<br>Infections 152<br>Herpes 152<br>HIV-Associated Gingivitis 152<br>Oral Soft Tissue Biopsy Techniques 153<br>Armamentarium 153<br>Incisional Scalpel Biopsy 153<br>Excisional Scalpel Biopsy 154<br>Biopsy Data Sheet 154 |            |
| <b>10. Periodontal Medicine Including Biopsy Techniques</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>137</b>                                                                                                                                                                                                                                                                                                                  | <b>11. Sinus Augmentation Using Tissue-Engineered Bone</b>                                                                                                                                                                                                                                                  | <b>159</b> |
| <i>Vikki Noonan and Sadru Kabani</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                             | <i>Ulrike Schulze-Späte, Luigi Montesani, and Lorenzo Montesani</i>                                                                                                                                                                                                                                         |            |
| Gingival Nodules 137<br>Parulis 137<br>Fibroma 137<br>Peripheral Ossifying Fibroma 137<br>Pyogenic Granuloma 138<br>Peripheral Giant Cell Granuloma 138<br>Diagnosis and Treatment of Reactive Gingival Nodules 139<br>Gingival Cyst of the Adult 139<br>Mucocele 139<br>Desquamative Gingivitis 140<br>Lichen Planus 140<br>Pemphigus Vulgaris 141<br>Mucous Membrane (Cicatricial) Pemphigoid 141<br>Diagnosis and Treatment of Desquamative Gingival Lesions 142<br>Plasma Cell Gingivitis 142<br>Erythema Multiforme 143<br>Gingival Enlargement 144<br>Epulis Fissuratum 144<br>Medication-Induced Gingival Overgrowth 144<br>Hyperplastic Gingivitis 144<br>Leukemia 145<br>Gingival Fibromatosis 145<br>Ligneous Gingivitis and Conjunctivitis 145<br>Wegener's Granulomatosis 146<br>Pigmented Lesions 146<br>Physiologic Pigmentation 146<br>Medication-Induced Pigmentation 146<br>Smoker's Melanosis 147<br>Amalgam Tattoo 147<br>Melanotic Macule 148<br>Oral Melanoacanthoma (Melanoacanthosis) 148<br>Oral Melanocytic Nevus 148<br>Oral Melanoma 149<br>Sanguinaria-Induced Leukoplakia 149<br>Proliferative Verrucous Leukoplakia 149<br>Malignant Neoplasia 150 | History 159<br>Indications 159<br>Contraindications 160<br>Armamentarium 160<br>Sinus Augmentation Using Tissue-Engineered Bone Discs 160<br>Transplant Implantation Surgery (Sinus Augmentation Procedure Using Tissue-Engineered Bone Discs) 161<br>Sinus Lift Using Autogenous Mesenchymal Cells Processed Chairside 165 |                                                                                                                                                                                                                                                                                                             |            |
| <b>12. Extraction Site Management in the Esthetic Zone: Hard and Soft Tissue Reconstruction</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>169</b>                                                                                                                                                                                                                                                                                                                  | <b>13. Clinical Applications of Tissue Engineering</b>                                                                                                                                                                                                                                                      | <b>179</b> |
| <i>Sherif Said</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                             | <i>Ulrich G. Schäfer, Michael H. Kamm, and Michael A. Bilezikian</i>                                                                                                                                                                                                                                        |            |
| Introduction 169<br>The Influence of Tissue Volume on the Peri-Implant "Pink" Esthetics 169<br>Tissue Volume Availability and Requirements 169<br>Pre-Operative Implant Site Assessment 172<br>Tissue Augmentation at the Time of Tooth Extraction 175<br>Management of Class I Sockets 177<br>Armamentarium 177<br>Three-Dimensional Implant Positioning 179<br>Selection of the Bone Graft Material 180<br>Rationale 181<br>Socket Seal 183<br>Autogenous Tissue for Concomitant Buccal Volume Augmentation and Socket Seal Procedures 186<br>Sub-Epithelial Connective Tissue Graft 186<br>Compromised Sockets 192<br>Flapless Ridge Preservation 192                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>13. Clinical Applications of Tissue Engineering</b>                                                                                                                                                                                                                                                                      | <b>179</b>                                                                                                                                                                                                                                                                                                  |            |

|                                                                                       |            |  |
|---------------------------------------------------------------------------------------|------------|--|
| Ridge Preservation Utilizing Barrier Membranes                                        | 193        |  |
| Esthetic Ridge Augmentation                                                           | 194        |  |
| Open Flap Approach for Extraction Site Management                                     | 197        |  |
| Site Analysis and Classification                                                      | 197        |  |
| Surgical Phase                                                                        | 198        |  |
| Suturing of the Graft                                                                 | 203        |  |
| Stabilization of the Graft                                                            | 205        |  |
| Closure                                                                               | 205        |  |
| Managing Implant Tissue Deficiencies                                                  | 206        |  |
| Conclusion                                                                            | 210        |  |
| <b>13. Digital Technologies in Clinical Restorative Dentistry</b>                     | <b>213</b> |  |
| <i>Vygandas Rutkūnas, Rokas Borusevičius, Agnė Gečiauskaitė, and Justinas Pletkus</i> |            |  |
| From Conventional to Digital Technologies                                             | 213        |  |
| Digital Solutions for Planning and Manufacturing of Teeth-Supported Restorations      | 214        |  |
| Digital Solutions for Planning and Manufacturing of Implant-Supported Restorations    | 223        |  |
| Future Perspectives                                                                   | 227        |  |
| <b>Index</b>                                                                          | <b>233</b> |  |