

About the Editors xv

List of Contributors xvii

Foreword xxi

Preface xxiii

Acknowledgements xxv

1 An Overview of Orthodontic Temporary Anchorage Devices 1

Hu Long, Xiaoqi Zhang, Xianglong Han, and Wenli Lai

1.1 Introduction 1

1.2 Evolution of Orthodontic TADs 1

1.3 Characteristics of Orthodontic TADs 2

1.4 Mechanical Retention of Orthodontic TADs 5

1.5 Clinical Indications for Orthodontic TADs 9

1.6 Potential Complications 19

1.7 Summary 21

2 Requirements for the Insertion of Orthodontic Temporary Anchorage Devices 25

Lin Xiang, Ziwei Tang, Jing Zhou, Hong Zhou, Qingxuan Wang, Waseem S. Al-Gumaei, Hu Long, and Liang Zhang

2.1 Introduction 25

2.2 Systemic Requirements 26

2.3 Local Requirements 32

2.4 Summary 51

3 General Principles for the Insertion of Orthodontic Temporary Anchorage Devices 55

Hu Long, Xinyu Yan, Yanzi Gao, Qingxuan Wang, Chenghao Zhang, Rui Shu, Wen Liao, and Xianglong Han

3.1 Introduction 55

3.2 Anatomy-driven Paradigm 56

3.3 Biomechanics-driven Paradigm 75

3.4 Clinical Procedures for Inserting Mini-implants 85

3.5 Summary 92

4 Maxillary Labial Region 95

Donger Lin, Huiyi Hong, Xiaolong Li, Jialun Li, Haoxin Zhang, Hong Zhou, Yan Wang, and Hu Long

4.1 Introduction 95

4.2 Interradicular Sites 95

4.3 Anterior Nasal Spine 125

4.4 Summary 143

5 Maxillary Buccal Region 145

Lingling Pu, Yanzi Gao, Qinxuan Song, Yang Zhou, Ying Jin, Yongwen Guo, Xianglong Han, and Hu Long

5.1 Introduction 145

5.2 Interradicular Sites 145

5.3 Infrazygomatic Crest 183

5.4 Maxillary Tuberosity 223

5.5 Summary 232

6 Maxillary Palatal Region 235

Jing Zhou, Xinwei Lyu, Hong Zhou, Jiabao Li, Wenqiang Ma, Heyi Tang, Tianjin Tao, Peipei Duan, and Hu Long

6.1 Introduction 235

6.2 Interradicular Sites 238

6.3 Paramedian Sites 270

6.4 Midpalatal Suture 296

6.5 Summary 301

7 Mandibular Labial Region 303

Yi Yang, Donger Lin, Lingling Pu, Shizhen Zhang, Yan Wang, Erpan Alkam, and Hu Long

7.1 Introduction 303

7.2 Interradicular Sites 305

7.3 Mandibular Symphysis 320

7.4 Summary 330

8 Mandibular Buccal Region 333

Qi Fan, Lu Liu, Chaolun Mo, Xinxiong Xia, Yushi Zhang, Rui Shu, Liang Zhang, and Hu Long

8.1 Introduction 333

8.2 Interradicular Sites 335

8.3 Buccal Shelf 364

8.4 Summary 386

9 Mandibular Ramus 389

Qianyun Kuang, Qi Fan, Chengge Hua, Lingling Pu, and Hu Long

9.1 Introduction 389

9.2 Anatomical Considerations 389

9.3 Mini-implant Selection 396

9.4 Insertion Procedure 397

9.5 Versatile Clinical Applications 402

9.6 Summary 413

10 The Placement of Miniplates 415

Lingling Pu, Yi Yang, Xuechun Yuan, Hu Long, and Chengge Hua

10.1 Introduction 415

10.2 Clinical Features 415

10.3 Clinical Indications 420

10.4 Insertion Techniques 431

10.5 Removal Techniques 433

10.6 Summary 434

11 Three-dimensional Design and Manufacture of Insertion Guides 437

Niansong Ye, Lingling Pu, Qi Fan, Wenqiang Ma, Yanqing Wu, Wenli Lai, and Hu Long

11.1 Introduction 437

11.2 Evolution of Insertion Guides 437

11.3 Advantages and Disadvantages of Insertion Guides 446

11.4 Three-dimensional Design of Insertion Guides for Mini-implants 451

11.5 Manufacturing Insertion Guides 464

11.6 Summary 470

12 Clinical Techniques for Using Insertion Guides 473

Lingling Pu, Qi Fan, Yuetian Li, Omar M. Ghaleb, Hu Long, and Niansong Ye

12.1 Introduction 473

12.2 Clinical Procedures 473

12.3 Placement of Mini-implants with Insertion Guides at Different Sites 479

12.4 Summary 485

13 Root Contact 487

Xinyu Yan, Yan Wang, Jianru Yi, Hu Long, Xianglong Han, and Wenli Lai

13.1 Introduction 487

13.2 Clinical Manifestations 488

13.3 Prognosis 490

13.4 Risk Factors 493

13.5 Prevention 496

13.6 Management of Root Contact 498

13.7 Summary 499

14 Fractures of Orthodontic Temporary Anchorage Devices 501

Hong Zhou, Jing Zhou, Fan Jian, Heyi Tang, Jianru Yi, Xiaolong Li, and Hu Long

14.1 Introduction 501

14.2 Risk Factors for Mini-implant Fracture 504

14.3 Prevention of Mini-implant Fracture 508

14.4 Management of Mini-implant Fracture 511

14.5 Summary 512

15 Soft Tissue Complications 515

Lin Xiang, Ziwei Tang, Jing Zhou, Heyi Tang, Hu Long, and Jianru Yi

15.1 Introduction 515

15.2 Clinical Manifestations 516

15.3 Adverse Consequences 519

15.4 Risk Factors 520

15.5 Prevention 525

15.6 Treatment 528

15.7 Summary 530

16 Failure of Orthodontic Temporary Anchorage Devices 533

Xinyu Yan, Xiaoqi Zhang, Jianru Yi, Chen Liang, Xi Du, Lingling Pu, and Hu Long

16.1 Introduction 533

16.2 Primary Stability and Secondary Stability 534

16.3 Risk Factors 537

16.4 Prevention of Mini-implant Failure 543

16.5 Management of Mini-implant Failure 544

16.6 Summary 546

References 546

Index 549