

# Table of contents

---

## **A BASIC PRINCIPLES 1**

### **1 Introduction 3**

- 1.1 The implant prosthodontist as architect 4
- 1.2 Structure of this book 4
- 1.3 Implant prosthodontics – challenges and conflicts 5

### **2 Patient profile 7**

- 2.1 Patient personalities 8
- 2.2 Developing the patient profile 9
- 2.3 Decision trees 10
- 2.4 Principal factors of the patient profile 11
- 2.5 Practical significance of the patient profile using a patient case example 12
- 2.6 Chapter summary 18

### **3 Esthetic profile 19**

- 3.1 Smile analysis as part of implant planning 20
- 3.2 Esthetics checklist 21
- 3.3 Use of the checklist in a clinical case example 35
- 3.4 Checklist in combination with additional aids 39
- 3.5 Chapter summary 41

### **4 Dental prosthesis profile 43**

- 4.1 Single-tooth gap, multi-tooth gap, and free-end situation 44
- 4.2 Severely reduced dentition 50
- 4.3 The edentulous arch 52
- 4.4 Chapter summary 57

### **5 Implant-abutment profile 59**

- 5.1 Mechanical and biomechanical properties 60
- 5.2 Biological properties 67
- 5.3 Chapter summary 68

### **6 Timing of implant placement and loading protocols in implantology 71**

- 6.1 Remodeling processes in and around extraction sockets 72
- 6.2 Measures for structural preservation of the residual ridge 73
- 6.3 Biotype 74
- 6.4 Timing of implant placement 74
- 6.5 Loading protocols in implantology 77
- 6.6 Clinical examples of immediate restoration 79
- 6.7 Chapter summary 89

## **7 Emergence profile 91**

- 7.1 The emergence profile in implantology and how it is shaped 92
- 7.2 Using the emergence profile to adjust positions and axes 95
- 7.3 Chapter summary 97

---

## **B TREATMENT CONCEPT AND TREATMENT PLANNING 99**

### **8 Treatment concept 101**

- 8.1 Medical and dental history 102
- 8.2 Bisphosphonate treatment and the resultant contraindications to implant placement 102
- 8.3 Examination/assessments and diagnoses 103
- 8.4 Prognoses of individual teeth 105
- 8.5 Treatment course 105
- 8.6 Preserving doubtful teeth as part of the implant planning process 105
- 8.7 Seven basic rules of implant prosthodontic planning in the partially and severely reduced dentition 106
- 8.8 Application of the treatment concept in a patient example 114
- 8.9 Five success factors/dos and don'ts for a challenging treatment concept 122
- 8.10 Chapter summary 123

### **9 Using decision trees to select the best individual treatment 125**

- 9.1 Single-tooth gap in the esthetic zone 126
- 9.2 Multi-tooth gap and free-end situation 126
- 9.3 Severely reduced dentition 129
- 9.4 The edentulous arch 131
- 9.5 Choice of materials and cementation protocols for fixed dental prostheses 133

---

## **C CLINICAL PROCEDURE 135**

### **10 Radiographic analysis and the surgical guide 137**

- 10.1 Two-dimensionally planned implant treatments using an orientation template 140
- 10.2 Summary – orientation template 148
- 10.3 Three-dimensionally planned and template-guided implant therapy 148
- 10.4 Summary – navigation template 170
- 10.5 Augmentation template 170
- 10.6 Summary – augmentation template 178

### **11 Surgical procedure 179**

- 11.1 Implant surgery 180
- 11.2 Second stage surgery 189
- 11.3 Free gingival graft to widen the zone of keratinized mucosa 193

## **12 Provisional restoration 197**

- 12.1 Basic tasks 198
- 12.2 General aspects of the direct fabrication of provisionals 198
- 12.3 Concept of the provisional restoration in the highly esthetic region 203
- 12.4 Provisional restorations for larger gaps and free-end situations 213
- 12.5 Provisional restoration of the edentulous arch 218
- 12.6 Prosthesis-free interval 218
- 12.7 Provisional implants 220

## **13 Impression-taking technique 221**

- 13.1 Transfer technique 222
- 13.2 Pick-up technique 225
- 13.3 Intraoperative impression-taking/registration 227
- 13.4 Custom impression copings 227
- 13.5 Impression tray with film technique 227
- 13.6 Splinting the implants before taking the impressions 228
- 13.7 Creative solutions for impression-taking 228
- 13.8 Gingival mask on the master cast 230
- 13.9 Chapter summary 231

## **14 The maxillomandibular relationship record 233**

- 14.1 Intraoral maxillomandibular relationship record 234
- 14.2 Facebow registration 247
- 14.3 Linefinder 247
- 14.4 Chapter summary 250

## **15 Crowns and fixed dental prostheses 251**

- 15.1 Implant abutments 252
- 15.2 Metal-ceramic and all-ceramic systems 262
- 15.3 The performance of fixed restorations on implants 267
- 15.4 Transferring literature data: performance of fixed all-ceramic restorations on teeth 269
- 15.5 Treatment concept 269
- 15.6 Details of crown and FDP fabrication 270
- 15.7 Should crowns and short-span FDPs be splinted? 288
- 15.8 Screw retention or cementation? 292
- 15.9 Cement retention 293
- 15.10 Screw retention 302
- 15.11 Bridging vertical defects with fixed reconstructions 310
- 15.12 Chapter summary 312

## **16 Removable restorations 317**

- 16.1 Stud systems 318
- 16.2 Bars 327
- 16.3 Double crowns 334
- 16.4 The special case of the narrow and high residual ridge: restoration with implants of reduced diameter 344
- 16.5 Chapter summary 346

## **17 Occlusion concepts 349**

- 17.1 Concept of biomechanical occlusion 350
- 17.2 Masticatory force distribution between molars, premolars, and anterior teeth 352
- 17.3 Concept of dynamic occlusion 353
- 17.4 Implant overload due to premature occlusal contacts 354
- 17.5 Protective splint (nightguard) 355
- 17.6 Clinical case report 357
- 17.7 Chapter summary 359

## **18 The significance of intraoral optical impressions in implant prosthodontics 361**

- 18.1 Reasons for using the optical impression in implant prosthodontics 362
- 18.2 Overview and mode of operation of the intraoral scanners 363
- 18.3 Scientific data on the trueness of intraoral optical impression systems 367
- 18.4 Intraoral optical data acquisition as a basic component in the planning of implant-supported prostheses 368
- 18.5 Implant superstructure based on an intraoral optical impression 379
- 18.6 Provisional implant superstructure based on the intraoral optical impression 388
- 18.7 Chapter summary 390

## **19 Aftercare and recall 393**

- 19.1 The need for a systematic recall program 394
- 19.2 The concept of the aftercare check-up 394
- 19.3 Recall interval 408
- 19.4 Supportive periodontal therapy (SPT) 409
- 19.5 Chapter summary 410

## **20 Prosthetic complications 411**

- 20.1 Complications arising from inadequate patient information 412
- 20.2 Types of complications with implant-supported fixed dental prostheses 413
- 20.3 Types of complications with implant-supported removable prostheses 428
- 20.4 Chapter summary 438

---

## **D RESTORATION CONCEPTS 439**

### **21 Single-tooth gap within the esthetic zone 441**

- 21.1 Screw-retained all-ceramic anterior tooth restoration 442

### **22 Multi-tooth gap or free-end situation 455**

- 22.1 Free-end situation with metal-ceramic crowns 457

### **23 Severely reduced dentition 467**

- 23.1 Increasing the number of abutments for an existing, sufficient removable dental prosthesis 469
- 23.2 Double crowns (electroplated gold telescopic crowns) 475
- 23.3 Double crowns (telescopic crowns, classic technique) 489

## **24 The edentulous arch 501**

- 24.1 Stud attachments: a Locator restoration 503
- 24.2 The single midline implant in the edentulous mandible 513
- 24.3 CAD/CAM-fabricated bar restoration of the edentulous maxilla 519
- 24.4 Fixed restoration (low vertical defect) 531
- 24.5 Fixed restoration (high vertical defect) 545

---

## **E LABORATORY PROCEDURES 567**

### **25 Fixed restorations on implants 569**

- 25.1 Cast fabrication – maxillomandibular relationship record – wax-up 570
- 25.2 Laboratory fabricated provisional restoration based on the intraoperative impression 572
- 25.3 Cement-retained crowns with a prefabricated titanium abutment 577
- 25.4 Cement-retained crowns with CAD/CAM-fabricated titanium abutments 583
- 25.5 Screw-retained crown with a cast-on gold framework 584
- 25.6 Screw-retained crowns with CAD/CAM-fabricated non-precious metal frameworks 592
- 25.7 Screw-retained crown with CAD/CAM-fabricated zirconia framework 593

### **26 Fixed restorations on implants in the edentulous arch 605**

- 26.1 Cast fabrication – maxillomandibular relationship record – wax-up 606
- 26.2 Metal-reinforced long-term provisionals (cement-retained) 608
- 26.3 Definitive restoration 613

### **27 Removable prostheses on implants 641**

- 27.1 Radiographic template/surgical guide 642
- 27.2 Master casts and the maxillomandibular relationship record 649
- 27.3 Removable restoration on Locator anchoring elements 654
- 27.4 Removable restoration on electroplated gold telescopic crowns 662
- 27.5 Removable restoration on a CAD/CAM-fabricated bar 675
- 27.6 Chapter summary 686

---

## **APPENDIX 687**

- Materials, instruments, equipment, and software 688
- References 694
- Index 703