

PRINCIPLES and BIOMECHANICS of ALIGNER TREATMENT

Ravindra Nanda, BDS, MDS, PhD

Professor Emeritus
Department of Orthodontics
University of Connecticut Health Center
Farmington, Connecticut, USA

Tommaso Castroflorio, DDS, PhD, Ortho. Spec.

Department of Surgical Sciences, Postgraduate School of Orthodontics
Dental School, University of Torino
Torino, Italy

Francesco Garino, MD, Ortho. Spec.

Private Practice
Torino, Italy

Kenji Ojima, DDS, MDSc

Private Practice
Tokyo, Japan



Contents

- 1** *Diagnosis and Treatment Planning in the Three-Dimensional Era* 1
TOMMASO CASTROFLORIO, SEAN K. CARLSON, and FRANCESCO GARINO
- 2** *Current Biomechanical Rationale Concerning Composite Attachments in Aligner Orthodontics* 13
JUAN PABLO GOMEZ ARANGO
- 3** *Clear Aligners: Material Structures and Properties* 30
MASOUD AMIRKHANI, FAYEZ ELKHOLY, and BERND G. LAPATKI
- 4** *Influence of Intraoral Factors on Optical and Mechanical Aligner Material Properties* 35
FAYEZ ELKHOLY, SILVA SCHMIDT, MASOUD AMIRKHANI, and BERND G. LAPATKI
- 5** *Theoretical and Practical Considerations in Planning an Orthodontic Treatment with Clear Aligners* 42
TOMMASO CASTROFLORIO, GABRIELE ROSSINI, SIMONE PARRINI
- 6** *Class I Malocclusion* 51
MARIO GRECO
- 7** *Aligner Treatment in Class II Malocclusion Patients* 66
TOMMASO CASTROFLORIO, WADDAH SABOUNI, SERENA RAVERA, and FRANCESCO GARINO
- 8** *Aligners in Extraction Cases* 83
KENJI OJIMA, CHISATO DAN, and RAVINDRA NANDA
- 9** *Open-Bite Treatment with Aligners* 95
ALDO GIANCOTTI and GIANLUCA MAMPIERI
- 10** *Deep Bite* 109
LUIS HUANCA, SIMONE PARRINI, FRANCESCO GARINO, and TOMMASO CASTROFLORIO
- 11** *Interceptive Orthodontics with Aligners* 121
TOMMASO CASTROFLORIO, SERENA RAVERA, and FRANCESCO GARINO
- 12** *The Hybrid Approach in Class II Malocclusions Treatment* 137
FRANCESCO GARINO, TOMMASO CASTROFLORIO, and SIMONE PARRINI
- 13** *Aligners and Impacted Canines* 149
EDOARDO MANTOVANI, DAVID COUCHAT, TOMMASO CASTROFLORIO
- 14** *Aligner Orthodontics in Prerestorative Patients* 168
KENJI OJIMA, CHISATO DAN, and TOMMASO CASTROFLORIO
- 15** *Noncompliance Upper Molar Distalization and Aligner Treatment for Correction of Class II Malocclusions* 190
BENEDICT WILMES and JÖRG SCHWARZE
- 16** *Clear Aligner Orthodontic Treatment of Patients with Periodontitis* 202
TOMMASO CASTROFLORIO, EDOARDO MANTOVANI, and KAMY MALEKIAN
- 17** *Surgery First with Aligner Therapy* 235
FLAVIO URIBE and RAVINDRA NANDA
- 18** *Pain During Orthodontic Treatment: Biologic Mechanisms and Clinical Management* 252
TIAN TONG LOU, JOHNNY TRAN, ALI TASSI, and IACOPO CIOFFI
- 19** *Retention and Stability Following Aligner Therapy* 259
JOSEF KUČERA and IVO MAREK
- 20** *Overcoming the Limitations of Aligner Orthodontics: A Hybrid Approach* 275
LUCA LOMBARDO and GIUSEPPE SICILIANI
- Index** 290