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Learning Objectives

After completion of this exercise, the participant will be able to:

1. Compare the optical properties of various types of clear aligners.
2. Describe a rapid palatal expansion system in which the availability of bone for mini-implant insertion is prioritized.
3. Discuss the options for treatment of a patient with transposed canines and first premolars.
4. Review the current evidence regarding the effects of bisphosphonates (BPs) on orthodontic tooth movement in postmenopausal women.

Article 1

Cremonini, F.; Zabini, F.; Oliverio, T.; Bianchi, A.; Scalia, S.; Siciliani, G.; and Lombardo, L.: *Optical Properties of Seven Types of Clear Aligners Before and After In Vitro Aging* (pp. 149-157)

1. Most clear aligners are manufactured from:
 - a) thermoplastic polyurethane
 - b) modified polyethylene terephthalate glycol
 - c) modified polypropylene
 - d) polycarbonate
2. The optical properties of the aligner samples in this study were measured with:
 - a) spectrophotometry
 - b) cone-beam computed tomography
 - c) medical computed tomography
 - d) a foot-candle meter
3. Among the seven types of aligners tested, the highest transparency was shown by the F22 and:
 - a) All In
 - b) Arc Angel

- c) Invisalign
 - d) F22 EvoFlex
4. The lowest transparency was shown by the Air Nivol and:
 - a) All In
 - b) Arc Angel
 - c) Invisalign
 - d) F22 EvoFlex

Article 2

Wilmes, B.; De Gabriele, R.; Dallatana, G.; Tarraf, N.; and Ludwig, B.: *"Bone First" Principle with CAD/CAM Insertion Guides for Mini-Implant-Assisted Rapid Palatal Expansion* (pp. 158-166)

5. In the "appliance first" technique for mini-screw-assisted expansion, the potential locations for mini-implant placement are limited by the:
 - a) quality of bone in the midpalate
 - b) load placed on the maxillary molars
 - c) prefabricated shape of the expander
 - d) availability of posterior insertion sites in the alveolar process
6. The software used by the authors for virtual planning and placement of mini-implants is:
 - a) Easy Driver
 - b) T-Zone
 - c) OrthoLox
 - d) 3D Slicer
7. The optimal sites for mini-implant insertion are identified using:
 - a) spectrophotometry
 - b) cone-beam computed tomography
 - c) a lateral cephalogram
 - d) a 3D-printed insertion guide

8. The Quadexpander avoids the problem of the amount of load placed on the maxillary molars because it is:

- a) a hybrid appliance
- b) digitally designed
- c) purely boneborne
- d) all of the above

Article 3

Kook, Y.A.; Ku, J.H.; Park, J.H.; Park, C.O.; and Kim, Y.: *Treatment of Transposed Canines and First Premolars Using Miniscrew Anchorage* (pp. 167-174)

9. Previously published techniques for movement of a transposed canine and first premolar into their proper positions generally required:

- a) extraction of the premolar
- b) palatal traction of the premolar
- c) the use of lingual appliances
- d) intrusion of the opposing teeth

10. In the authors' technique, the transposed canine is moved using a:

- a) long ligature wire between a bonded button and a miniscrew
- b) transpalatal arch
- c) long-hook bracket and an archwire segment
- d) modified C-palatal plate

11. The transposed premolar is moved using a:

- a) long ligature wire between a bonded button and a miniscrew
- b) transpalatal arch
- c) long-hook bracket and an archwire segment
- d) modified C-palatal plate

12. To select the best treatment option for correcting a canine-first premolar transposition, the authors recommend:

- a) the use of a digitally designed insertion guide
- b) virtual treatment planning using CAD/CAM software

c) fabrication of a customized miniscrew-anchored palatal appliance

d) early diagnosis with cone-beam computed tomography

Article 4

Listik, E.; Giro, G.; Negrisoni, S.; Rodrigues, I.V.; Duarte, P.M.; and Nahás-Scocate, A.C.R.: *Bisphosphonate Therapy and Orthodontics: Implications for Postmenopausal Women* (pp. 175-182)

13. The capacity of nitrogen-containing BPs to induce apoptosis of osteoclasts is based on their inhibition of:

- a) calcium phosphate
- b) farnesyl pyrophosphate synthase
- c) mevalonic acid
- d) geranyl pyrophosphate

14. Tissue remodeling is promoted by all of the following active agents except:

- a) cytokines
- b) prostaglandins
- c) melavonic acid
- d) colony-stimulating factors

15. After menopause, the lack of estrogen diminishes the secretion of:

- a) osteoprotegerin
- b) receptor activator of nuclear factor kappa-B
- c) melavonic acid
- d) macrophage colony-stimulating factor

16. Studies of postmenopausal women taking BPs suggest:

- a) increased orthodontic-induced root resorption
- b) a greater chance of open contacts and poor root parallelism after orthodontic treatment
- c) impaired orthodontic tooth movement
- d) both b and c