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Learning Objectives

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

1. Discuss the biomechanics involved in skeletal Class II correction with Herbst appliances.
2. Contrast a hybrid aligner approach to other methods of treating adult Class III patients with severe deep bites.
3. Compare various methods of treating adult patients with severe open bites.
4. Describe the effects of high-frequency neuromodulation on dental pain.

Article 1

De Clerck, H.; Timmerman, H.; Vloebergh, K.; Siciliano, S.; and, Nguyen, T.: *Facial Growth Modification with a Bone-Anchored Herbst Appliance, Part 1* (pp. 532-539)

1. Mechanisms that can be exploited to promote forward growth of the chin include:
   a) true mandibular lengthening
   b) bone modeling in the ramus or glenoid fossa
   c) true mandibular rotation
   d) all of the above
2. The true mandibular length is the distance from a tangent to the most posterior point on the condyle to a tangent to the:
   a) most superior point on the chin
   b) most anterior point on the chin
   c) most superior point on the condyle
   d) true center of the glenoid fossa
3. A 1° forward rotation of the mandible increases chin projection by:
   a) 1.1mm
   b) 1°
   c) 1mm
   d) 2°
4. With the hybrid bone-anchored Herbst appliance, proclination of the lower incisors is:
   a) prevented by the tubes and rods
   b) counteracted by normal growth
   c) limited by the skeletal anchorage
   d) promoted by the pressure of the tongue

Article 2

Moon, J.H.; Kim, S.H.; Kim, S.S.; Choi, Y.K.; and Kim, Y.I.: *Hybrid Aligner Treatment of an Adult Patient with a Class III Malocclusion, Anterior Crossbite, and Deep Bite* (pp. 540-551)

5. According to a study by Kravitz and colleagues, the most accurate tooth movement achieved with Invisalign is:
   a) lingual constriction
   b) extrusion
   c) incisor tipping
   d) molar intrusion
6. In clear aligner therapy, a posterior open bite can be caused by:
   a) anterior premature contacts
   b) molar intrusion due to the thickness of the aligner plastic
   c) incisor tipping
   d) either a or b
7. This risk can be mitigated by any of the following methods except:
   a) prescribing shorter periods of aligner wear
   b) delivering passive aligners with the molar areas trimmed away for use after active treatment

c) using skeletal anchorage in conjunction with the aligner wear
d) using intermaxillary elastics

8. An increase in lower facial height achieved through clockwise rotation of the mandible produces a corresponding increase in the:
a) mandibular plane angle
b) occlusal vertical dimension
c) chin projection
d) maxillary transverse dimension

Article 3

Martino, F.: *Orthodontic Treatment of an Adult with a Severe Open Bite Produced by Occlusal Interferences* (pp. 557-564)

9. Common etiologic factors leading to development of a complex open bite in an adult patient include all of the following except:
a) vertical growth deficiency
b) abnormal dental eruption
c) maxillary transverse deficiency
d) premature contacts

10. When an anterior open bite associated with protrusive incisors is treated nonsurgically, more stable results can usually be obtained with:
a) canine extractions
b) premolar extractions
c) second-molar extractions
d) nonextraction therapy

11. In the case shown here, the tilted lower molars were uprighted with:
a) boot loops bent from TMA wire
b) nickel titanium archwires
c) clear aligners with cutouts added for intermaxillary elastics
d) segmented Essix retainers

12. To reduce patient discomfort and the chances of noncompliance, the author used:
a) intermaxillary cross-elastics
b) only nickel titanium archwires
c) clear aligners only for the final eight months of treatment
d) fixed appliances only in the lower arch for the first eight months of treatment

Article 4

Haralambidis, C. and Nicozisis, J.: *High-Frequency Neuromodulation with the Dental Pain Eraser for Nonpharmacologic Pain Relief in Orthodontic Practice* (pp. 567-572)

13. Neuromodulation has a direct effect on the:
a) central nervous system
b) peripheral nervous system
c) patient's response threshold
d) periodontal ligament

14. When high-frequency biphasic stimulation is applied to the surface of the enamel or dentin, it:
a) blocks transient receptor potential channels in the odontoblasts
b) restricts the concentration of calcium ions within the cells
c) prevents the calcium-signaling cascade that transduces dental pain
d) all of the above

15. For common clinical orthodontic situations such as wire adjustments, detailing, or the initial insertion of fixed appliances or aligners, the Dental Pain Eraser should be applied for:
a) 10-20 seconds
b) 30-45 seconds
c) three to four minutes
d) at least five minutes

16. In a patient with TMJ-related intraoral muscle or ligament pain, a five-minute application to the sore area can:
a) provide long-term relief
b) produce a synergistic anesthetic effect
c) improve the joint's range of motion for subsequent procedures
d) both b and c