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Learning Objectives

After completion of this exercise, the participant will be able to:
1. Discuss the potential applications of individualized, three-dimensionally printed brackets.
2. Describe a comprehensive esthetic interdisciplinary approach to the treatment of short-face patients with clear aligners.
3. Use an osseointegrated implant-supported device as temporary anchorage for movement of a single tooth.
4. Compare the power efficiency of various battery-powered portable light-curing units.

Article 1

Bae, G.S.; Kim, Y.I.; Kim, S.S.; Park, S.B.; and Son, W.S.: *3D-Printed Double-Wire Bracket for Anterior Alignment* (pp. 377-381)

1. The "universal appliance" bracket introduced by Atkins in 1929 had:
   a) a single vertical slot
   b) a single horizontal slot
   c) both vertical and horizontal slots
   d) both occlusal and gingival horizontal slots
2. The authors' technique uses the elasticity of three-dimensional printing material to form the bracket's:
   a) slot entrance as a clip
   b) hook according to the desired mesiodistal angulation
   c) base for controlling in-out and rotational movements
   d) indirect-bonding jig to accommodate an extra bonding procedure
3. If full anterior retraction is required, the setup model with attached brackets must be printed as:
   a) a digital model
   b) a rapid prototyping model
   c) a thermoformed clear aligner
   d) a double-wire bracket template
4. Advantages of 3D-printed double-wire brackets include all of the following except:
   a) more rapid and precise leveling by means of the height differential between the slots
   b) effective torque control from the concurrent use of two round archwires
   c) accurate representation of fine details such as slot dimensions
   d) the potential of using lighter forces than with heavy rectangular wires

Article 2

Lin, J.C.Y.; Chen, S.; Liou, E.J.W.; Ojima, K.; and Bowman, S.J.: *Interdisciplinary Aligner Treatment of Short-Face Patients* (pp. 382-405)

5. "Short face" refers primarily to a clinical impression of:
   a) vertical maxillary deficiency
   b) deficient lower anterior facial height (LAFH)
   c) skeletal deep bite
   d) hypodivergent facial profile
6. The first step in comprehensive esthetic interdisciplinary treatment is to:
   a) increase LAFH to achieve a 50%/50% ratio with upper anterior facial height (UAFH)
   b) increase LAFH to achieve a 60%/40% ratio with UAFH

c) reduce UAFH to open the vertical dimension of occlusion (VDO)
d) improve the clinical crown sizes and proportions of the upper anterior teeth

7. Increasing the VDO is most effectively accomplished by:
a) extruding the posterior teeth with clear aligners
b) extruding the posterior teeth with fixed appliances
c) surgical or cosmetic procedures such as genioplasty or chin fat grafting
d) a combination of prosthodontic, orthodontic, and implant applications

8. Abduo and Lyons concluded that the VDO could be safely and predictably increased by:
a) less than 2mm
b) as much as 5mm
c) as much as 10mm
d) none of the above

Article 3

Weber, D.; Handel, S.; and Dunham, D.: *Use of Osseointegrated Implants for Orthodontic Anchorage* (pp. 406-410)

9. Reciprocal forces from orthodontic tooth movement can result in:
a) unintended movement of adjacent teeth
b) apical root resorption
c) supraeruption or canting
d) any of the above

10. The authors' handlebar-style technique (HST) can be applied with any of the following except:
a) an existing osseointegrated dental implant in ideal position
b) an existing osseointegrated dental implant in less-than-ideal position
c) a newly placed orthodontic miniplate
d) a newly placed osseointegrated dental implant

11. The handlebar-style device is cast in:
a) high-quality titanium
b) Type III gold
c) Olympia ceramometal alloy
d) either b or c

12. The HST should not be considered a substitute for comprehensive orthodontics because it cannot produce:
a) bodily tooth movement
b) rotational movement
c) intrusive movement
d) extrusive movement

Article 4

Özkan, S. and Gollerli, Y.Y.: *Effects of Declining Battery Voltage on Light Intensity and Power Consumption of Light-Curing Units* (pp. 411-418)

13. Polymerization of a resin-based composite (RBC) with a light-curing unit (LCU) is made possible by a photoinitiator known as:
a) lithium ion
b) azobisisobutyronitrile
c) camphorquinone
d) phenylacetophenone

14. In this study, the LCU that conserved its initial light intensity as voltage declined was the:
a) Elipar S10
b) VE-215I
c) YS-C
d) SK-L036A

15. To achieve adequate conversion of an RBC, sufficient energy is required, as expressed by the sum of:
a) shear bond strength and curing depth
b) light irradiance and exposure time
c) current and voltage
d) consumed power and light intensity

16. To prevent loss of light intensity during discharge of a lithium-ion battery, a portable LCU should have:
a) a temperature-regulating fan
b) an LED driver circuit with constant voltage
c) an LED driver circuit with constant current
d) all of the above