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Learning Objectives

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

1. Compare various treatment options for patients with multiple congenitally missing teeth.
2. Describe the in-office fabrication of palatal expanders using computer-aided technology and three-dimensionally printed resin blocks.
3. Discuss the application of 3D-printing technology in producing clear aligners.
4. Contrast the modified C-implant with the original device.

Article 1

Bashir, R.; Azami, N.; Uribe, F.; and Safavi, K.E.: *A Biological Orthodontic Approach for Multiple Missing Teeth: Tooth Substitutions and Autotransplantation* (pp. 436-445)

1. Transplanted teeth have been found to have about a 90% survival rate when the:
   a) donor tooth's root development is 50-75% of its full size
   b) anatomical conditions of the recipient site are favorable
   c) extracted tooth is ankylosed or severely infraoccluded
   d) periodontal ligament cells around the donor tooth are also transplanted
2. A premolar autotransplantation should ideally be performed when the patient:
   a) is in the early mixed dentition
   b) is around 12 years old
   c) has all permanent teeth except third molars
   d) has completed growth
3. Long-term studies of implant placement in the anterior mandibular arch have noted inadequate esthetic results due to:
   a) metal visibility
   b) gray discoloration of the gingiva
   c) occlusal discrepancies
   d) both a and b
4. Maintaining an ankylosed deciduous tooth without its permanent successor can result in:
   a) a narrow and resorbed alveolar ridge
   b) infraocclusion due to continuous eruption
   c) vertical bone defects in the adjacent teeth
   d) any of the above

Article 2

Lee, K.C.; Yoon, T.R.; and Choi, S.: *In-Office Fabrication of Palatal Expanders Using 3D-Printed Resin Blocks* (pp. 446-449)

5. The software used to design this device is:
   a) Materialise 3-matic
   b) OrthoCAD
   c) Rhinoceros
   d) Dental Wings
6. The toothborne portion of the appliance:
   a) is bonded to the lingual surfaces of the upper premolars and first molars
   b) includes 3D-printed resin blocks
   c) is customized to avoid occlusal interferences
   d) all of the above
7. Patient instructions should emphasize:
   a) the need to remove the toothborne portion for regular cleaning
   b) the importance of removing food debris from around the appliance

c) the potential need for long-term retention
d) both a and c

8. Unlike previously published approaches that require direct metal printing, this device uses:
a) a laser-sintering process
b) an additive manufacturing technique
c) a conventional Hyrax expansion screw
d) a resin expansion screw

Article 3

Kim, K.B. and Graf, S.: *Direct Printing of Clear Aligners* (pp. 450-458)

9. Tera Harz TC-85 is a:
a) polypropylene polymer
b) polymethyl methacrylate
c) thermoplastic shape-memory polymer
d) martensitic heat-activated polymer

10. At body temperature, TC-85 recovers about:
a) 50% of its deformation in the first minute
b) 90% of its deformation within 10 minutes
c) 100% of its deformation within 20 minutes
d) both a and b

11. With direct-printed aligners, an intrusive force can be applied to the posterior teeth by:
a) increasing the aligner thickness on the posterior occlusal surfaces
b) incorporating an anterior bite ramp
c) attaching solid bite wings to the buccal sides of the aligners
d) placing divots inside the aligners

12. Inaccuracies of as much as 56% in planned orthodontic movements with aligners can be attributed to:
a) the stiffness of the aligner material
b) a poor fit
c) improper placement of attachments
d) inability to control torque

Article 4

Kim, S.H.; Choi, J.Y.; Chung, K.R.; and Nelson, G.: *A Modified C-Implant for Simpler and More Efficient Treatment* (pp. 469-477)

13. To enable partial osseointegration, the original C-implant was designed with:
a) a removable head
b) a sandblasted, large-grit, acid-etched surface treatment
c) a modified cylindrical body
d) small notches in the screw spirals

14. Drawbacks of the C-implant include all of the following except:
a) lack of stability
b) complexity of insertion and removal
c) relatively large size
d) need for pilot drilling

15. The MC-implant avoids soft-tissue irritation because of its:
a) smaller screw spirals
b) one-piece design
c) rounded head
d) offset hole

16. Inclined insertion of the MC-implant is recommended to:
a) increase resistance to unscrewing forces
b) promote osseointegration
c) avoid damage to adjacent roots
d) both a and c