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Learning Objectives

After completion of this exercise, the participant will be able to:
1. Review the biomechanics of T-loop springs in retracting buccally displaced ectopic canines.
2. Discuss the digital design and in-house fabrication of customized aligners with shape memory.
3. Compare clear aligners to other methods of performing Class II camouflage treatment.
4. Describe the glass ionomer open exposure technique for palatally impacted canines.

Article 1

Chamberland, S.: *Independent Canine Retraction Using T-Loop Springs* (pp. 335-344)

1. If an activated closing loop is precisely centered between the brackets, the preactivation bends will produce:
   a) undesirable tooth movements in all three planes of space
   b) equal and opposite anterior and posterior residual moments
   c) a greater anterior moment than posterior moment
   d) a greater posterior moment than anterior moment
2. Variations in loop placement alter the magnitude of the moments by:
   a) creating a static system
   b) making the sum of the moments equal zero
   c) making the anterior and posterior segments equal in length
   d) making the anterior and posterior segments unequal in length
3. When T-loop springs are used for en-masse retraction, the loops are usually placed:
   a) near the center of resistance of the posterior segment
   b) midway between the anterior and posterior segments
   c) closer to the posterior segment to enhance posterior anchorage
   d) closer to the anterior segment to enhance anterior anchorage
4. In the cases shown here, uprighting of the ectopic canines was achieved by:
   a) translation and controlled tipping
   b) retraction and root movement
   c) molar mesialization and rotation
   d) en-masse retraction of the anterior segments

Article 2

Sivak, M.G.; Jo, Y.M.; Nanda, R.; and Bechtold, T.E.: *In-House 3D-Printed Shape Memory Aligners for Retreatment after Fixed Retainer Failure* (pp. 345-353)

5. The software used for digital planning in this case was:
   a) Fusion 360
   b) Orthosetup
   c) Rhinoceros
   d) Diagnocat
6. The staging protocol for each step involved .6mm of translation and as much as:
   a) 4° of rotational movement
   b) .4mm of interproximal reduction
   c) 2° of root torque
   d) .2mm of proclination

7. The shape-memory feature of the photopolymer used for 3D aligner printing has the advantage of enabling:
   a) full adaptation to the incisor crowns
   b) easy insertion after exposure to hot water
   c) flexibility for patient comfort
   d) all of the above
8. The authors' aligners were designed to be changed weekly because:
   a) they were too flexible to be changed more often than weekly
   b) conventional attachments had to be used
   c) a study of their ability to maintain mechanical properties had tested them for only one week
   d) errors in the digital workflow could have produced unintended forces and moments

Article 3

Sobral Costa, T.; Vaz Duarte, B.; and Sintra Delgado, A.: *Nonsurgical Treatment of an Adult Skeletal Class II Malocclusion with Clear Aligners* (pp. 354-365)

9. Undesirable vertical effects of typical Class II camouflage treatment include:
   a) extrusion of the posterior teeth
   b) intrusion of the incisors
   c) clockwise mandibular rotation
   d) both a and c
10. In Class II cases, the average percentage of the predicted anteroposterior correction achieved by clear aligners alone is reportedly:
   a) 6.8%
   b) 19.7%
   c) 35.6%
   d) 80.8%
11. The amount of upper-molar intrusion that can be achieved using clear aligners alone is reportedly:
   a) .1-.4mm
   b) .4-.6mm
   c) .8-1.1mm
   d) 2-3mm
12. In the adult patient shown here, using a combination of aligners with temporary anchorage devices and intermaxillary elastics, the authors achieved upper-molar intrusion of:
   a) .4mm
   b) .8mm
   c) 1.1mm
   d) 2mm

Article 4

Naoumova, J.; Hansson, J.; and Hansen, K.: *Glass Ionomer Open Exposure (GOPEX) of Palatally Impacted Canines* (pp. 381-389)

13. In the closed technique for canine exposure, a chain or ligature is bonded to the canine crown, and then:
   a) the cavity is filled with surgical packing
   b) the crown is covered with a glass ionomer cement
   c) the flap is sutured back in place
   d) a hole is punched through the mucosa
14. The GOPEX procedure is most effective during:
   a) early and middle adolescence
   b) late adolescence
   c) the pubertal growth spurt
   d) adulthood
15. The GOPEX technique should not be used:
   a) if the canine is blocked by or almost in contact with the lateral- or central-incisor root
   b) if resorption of the lateral or central incisor is observed
   c) if the canine is positioned horizontally, significantly apical to the mucogingival junction
   d) any of the above
16. In patients older than 18, surgical exposure may need to be combined with:
   a) orthognathic surgery
   b) orthodontic forced eruption
   c) skeletal anchorage
   d) slow maxillary expansion