nanoparticles combined with calcium hydroxide as intracanal medicament. *J Clin Exp Dent*. 2017;9(7):e842-e847.

- 9. Zimmerli B, Jeger F, Lussi A. Bleaching of nonvital teeth. A clinically relevant literature review. 2010;120(4):306-320.
- **10.** Chappuis V, Araujo MG, Buser, D. Clinical relevance of dimensional bone and soft tissue alterations post-extraction in esthetic sites. *Periodontol* 2000. 2017;73(1):73-83.
- 11. Pantaleón DS, Morrow BR, Cagna DR, et al. Influence of remaining coronal tooth structure on fracture resistance and failure mode of restored endodontically treated maxillary incisors. *J Prosthet Dent.* 2018;119(3):390-396.
- **12.** Wang IC, Barootchi S, Tavelli L, Wang HL. The peri-implant phenotype and implant esthetic complications. Contemporary review. *J Esthet Restor Dent*. 2021;33(1):212-223.
- **13.** Malpartida-Carillo V, Tinedo-Lopez PL, Guerrero ME, et al. Periodontal phenotype: a review of historical and current classifications evaluating different methods and characteristics. *J Esthet Restor Dent.* 2021;33(3):432-445.
- **14.** Fadag A, Negm M, Samran A, et al. Fracture resistance of endodontically treated anterior teeth restored with different post systems: an in vitro study. *Eur Endod J.* 2018;3(3):174-178.
- **15.** Heydecke G, Peters MC. The restoration of endodontically treated, single-rooted teeth with cast or direct posts and cores: a systematic review. *J Prosthet Dent.* 2002;87(4):380-386.
- **16.** Setzer FC, Kim S. Comparison of long-term survival of implants and endodontically treated teeth. *J Dent Res.* 2014;93(1):19-26.
- 17. Kahn FH, Rosenberg PA, Schulman A, Pines M. Comparison of fatigue for three prefabricated threaded post systems. *J Prosthet Dent*. 1996;75(2):148-153.
- **18.** Thorsteinsson TS, Yaman P, Craig RG. Stress analyses of four prefabricated posts. *J Prosthet Dent*. 1992;67(1):30-33.
- **19.** Meng QF, Chen LJ, Meng J, et al. Fracture resistance after simulated crown lengthening and forced tooth eruption of endodontically-treated teeth restored with a fiber post-and-core system. *Am J Dent*. 2009;22(3):147-150.
- **20.** Meng Q, Ma Q, Wang T, Chen Y. An in vitro study evaluating the effect of ferrule design on the fracture resistance of endodontically treated mandibular premolars after simulated crown lengthening or forced eruption methods. *BMC Oral Health*. 2018;18(1):83.
- **21.** Juloski J, Radovic I, Goracci C, et al. Ferrule effect: a literature review. *J Endod*. 2012;38(1):11-19.
- **22.** Tan PL, Aquilino SA, Gratton DG, et al. In vitro fracture resistance of endodontically treated central incisors with varying ferrule heights and configurations. *J Prosthet Dent.* 2005;93(4):331-336.
- **23.** Mannocci F, Bhuva B, Stern S. Restoring teeth following root canal re-treatment. *Endodontic Topics*. 2011;19(1):125-152.
- **24.** Pham HT, Nguyen PA, Pham TAV. Periodontal status of anterior teeth following clinical crown lengthening by minimally traumatic controlled surgical extrusion. *Dent Traumatol.* 2018;34(6):455-463.
- **25.** Scholtes E, Suttorp CM, Lohmanns BA, et al. Combined orthodontic, surgical, and restorative approach to treat a complicated crown-root fracture in a maxillary central incisor. *Am J Orthod Dentofacial Orthop*. 2018;154(4):570-582.
- **26.** Esposito S. Management of the dentogingival complex after forced eruption: a case report. *Gen Dent.* 2003;51(1):58-60.
- **27.** Angerame D, de Biasi M, Kalaj B, Maglione M. Surgical extrusion: a dental technique. *J Prosthet Dent*. 2021;125(1):23-28.
- 28. Hasson JN, Hasson B. Implant site development by orthodontic forced eruption for esthetic restoration of adjacent implants. *Clin Adv Periodontics*. 2016;6(3):146-152.
- **29.** Lin IP, Hsaing-Hua Lai E, Zwei-Chieng Chang J, Wang CY. Staged orthodontic treatment in preparation for immediate implant placement: a clinical report with a 5-year follow-up. *J Prosthet Dent*. 2019;122(6):503-509.
- **30.** Buskin R, Castellon P, Hochstedler JL. Orthodontic extrusion and orthodontic extraction in presprosthetic treatment using implant therapy. *Pract Periodontics Aesthet Dent.* 2000;12(2):213-219.

www.compendiumlive.com July/August 2021 COMPENDIUM 371

## **CONTINUING EDUCATION 2**

QUIZ

## The Fractured Endodontically Treated Maxillary Anterior Tooth: Restore or Replace?

Gary Solnit, DDS, MS

THIS ARTICLE PROVIDES 2 HOURS OF CE CREDIT FROM AEGIS PUBLICATIONS, LLC. CIRCLE YOUR ANSWERS BELOW AND COMPLETE THE INFORMATION TO THE RIGHT. OR LOG ON TO COMPENDIUMCE.COM/GO/2114.

- The decision to either restore or extract a compromised maxillary anterior tooth should be based on:
  - A. the patient's desires.
  - B. the clinician's experience.
  - C. set criteria and scientific research.
  - D. the need to "preserve what remains."
- 2. The literature suggests the 74-month survival rate of a restored, endodontically treated tooth is about:
  - A 13%
  - B. 43%.
  - C. 73%.
  - D. 93%.
- Despite an anterior restoration having excellent function, the patient might consider it an esthetic failure because:
  - A. of a lack of good ferrule effect with a post-and-core.
  - B. of the amount of crown lengthening needed.
  - C. esthetics are subjective.
  - D. the patient felt the treatment took too long.
- Dark discoloration at the gingival of a restored endodontically treated tooth may be due to:
  - A. the use of a zirconia post and composite buildup.
  - B. the type of endodontic file used during a root canal.
  - C. the cement used to place a cast post and core.
  - D. the antibiotic paste used during a root canal.
- Waiting too long to extract a fractured maxillary anterior tooth may result in:
  - A. more extensive damage and bone loss.
  - B. better preservation of available bone for an implant.
  - C. darkness at the gingival area of the tooth.
  - D. inadequate ferrule effect.

an annual report documenting their

accumulated credits, and are urged to

contact their own state registry boards

for special CE requirements.

- When determining whether to extract a compromised maxillary anterior tooth or restore it:
  - A. cost is never a factor in the decision.
  - B. cost is typically not a factor in the decision.
  - C. cost is usually the last thing a patient considers.
  - D. cost is typically a primary factor in the decision.
- Along with the amount of remaining tooth structure, the most important criterion when deciding whether to restore an endodontically treated maxillary tooth is:
  - A. the amount of gingival-colored porcelain needed.
  - B. the patient's smile line.
  - C. how much esthetic compromise will be acceptable.
  - D. the health of the patient's gingiva.
- 8. A literature review showed the amount of remaining tooth structure needed for predictable long-term post-and-buildup restorative results was:
  - A. 1mm. PROOF—NOT FOR PUBLICATION
  - B. 2 mm.
  - C. 4 mm.
  - D. 6 mm.
- Long-term restorative success of an endodontically treated tooth is more difficult to achieve:
  - A. in thin phenotype than in thick phenotype.
  - B. in thick phenotype than in thin phenotype
  - C. with square-shaped teeth than tapered teeth.
  - D. in a patient with a low smile line versus a high smile line.
- 10. When the decision has been made to extract and replace the tooth with an implant, the site can be optimized:
  - A. by waiting 3 months after diagnosis of a root fracture.
  - B. through adequate coronal seal.
  - C. through proper maintenance of gutta percha.
  - D. with extrusion of the root.

AEGIS Publications, LLC
Nationally Approved PACE Program Provider for
FAGD/MAGD credit. Approval does not imply
acceptance by any regulatory authority, or AGD
endorsement. 1/1/17 to 12/31/22. Provider ID# 209722. Course is valid from July 1, 2021, to August 31, 2024. Participants must attain a score of 70% on each guiz to receive credit. Participants receiving a failing grade on any exam will be notified and permitted to take one re-ADA C·E·R·P® | Continuing Education Recognition Program examination. Participants will receive

AEGIS Publications, LLC, is an ADA CERP Recognized Provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse inclividual courses or instruc-tors, nor does it imply acceptance of credit hours by boards of dentistry. Concerns or complaints about a CE provider may be directed to the provider or to ADA CERP at www.ada.org/cerp

PRESENTLY ENROLLED IN CE PROGRAM
1 JULY/AUGUST ISSUE EXAM COMPLETED = \$32 Cost is \$16 per credit hour
2 JULY/AUGUST ISSUE EXAMS COMPLETED = \$48  Cost is \$12 per credit hour
Please enroll me in the <i>Compendium</i> Continuing Education Program marked below.  Please enroll me in the 12 month CE Program for \$320.  (Cost is \$8 per credit hour)
Program includes 20+ exams (a minimum of 40 credit hours) in the <i>Compendium</i> for 1 year.
PAYMENT INFORMATION
CHECK (payable to AEGIS Communications)
CREDIT CARD Please complete information and sign below.  VISA MC
Card Number
Exp. Date: Month/Year
Signature Date
(PLEASE PRINT (LEARLY)  LAST 4 DIGITS OF SSN ADA NUMBER  AGD NUMBER
Month/Day of Birth/
NAME
ADDRESS
CITY STATE ZIP
E-MAIL ADDRESS
DAYTIME PHONE
Please mail completed forms with your payment to:
AEGIS Communications CE Department, 140 Terry Drive, Suite 103, Newtown, PA 18940 Allow approximately 2-3 weeks for processing.
SCORING SERVICES: By Mail   Fax: 215-504-1502 Phone-in: 877-423-4471 (9 am - 5 pm ET, Monday - Friday) Customer Service Questions? Please Call 877-423-4471

## **PROGRAM EVALUATION**

Please circle your	level of agreement with t	he following statements.
(4 = Strongly Agre	ee; 0 = Strongly Disagree)	

ı.	ciarity of objectives						
	4	3	2	1	0		

2. Usefulness of the content 2

3. Benefit to your clinical practice 4 3 2 1 0

4. Usefulness of the references 4 3 2 1 0

5. Quality of the written presentation

4 3 2 1 0

6. Quality of the illustrations 4 3 2 1 0

7. Clarity of review questions 4 3 2 1 0

8. Relevance of review questions

9. Did this lesson achieve its educational objectives?

10. Did this article present new information?

11. How much time did it take you to complete this lesson?

min

372