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Managing Restorative Emergencies, Part 2 of 2: Esthetic Emergencies (Fractures and Tooth Loss)

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2 CONTINUING EDUCATION CREDITS

COURSE OBJECTIVES

Upon completion of this course, the participant will be able to:

- Describe a management style for triage of restorative emergencies.
- List treatment choices for patients with dentin hypersensitivity.
- Describe a technique for treatment of a fractured tooth or restoration.
- Describe the management of a crown or bridge that needs to be recemented.
- Describe the management of a broken denture or partial denture.

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WHY TAKE THIS COURSE?

PATIENT CARE—Offer your patients the finest emergency care while managing triage more effectively.

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WHO SHOULD TAKE THIS COURSE?

Dentists, Dental Assistants and Dental Hygienists.

As stated in the article “Managing Restorative Emergencies Part 1,” it is not uncommon in any given week for a busy dental practice in general dentistry to expect at least five to ten emergency visits from their patients. Patients with restorative dental emergencies will call the practice and request a time to be seen, or, in some circumstances, the patient is so distressed they show up at the dental office requesting to be seen as quickly as possible. These visits can range from treatment for conditions as minor as dentin hypersensitivity or a chipped tooth to more major conditions, such as an acute infection that requires antibiotic therapy, surgical intervention, or perhaps teeth that require fabrication of a provisional restoration. In some cases, it might be a dropped and broken denture that needs repair.

The focus of this series of two articles is the treatment of restorative emergencies that relate to teeth not in the need for immediate endodontic treatment, oral surgery, or periodontal care. Restorative emergencies can be categorized as acute (urgent), subacute (not urgent), and esthetic (usually urgent by their nature). In most cases, esthetic emergencies are not associated with pain, but in a patient’s mind, need immediate attention. These circumstances can include a lost anterior crown, a fractured anterior tooth or restoration, an avulsed anterior tooth due to trauma, or the need for an immediate extraction of a tooth in the anterior zone due to periodontal disease or pulpal pathology. In Part 1, esthetic emergencies, the range of fractured anterior teeth, fractured porcelain from existing fixed partial dentures or crowns, and tooth loss due to periodontal or endodontic infection were described. No matter what the dental emergency is, you and your staff need to respond appropriately by having a clear protocol for managing the emergency situation. Part 2 of this series will review other restorative emergencies that fall into the acute (urgent) and subacute (not urgent) categories to include dentin sensitivity, fractured posterior teeth and restorations, crown and bridge emergencies, and denture emergencies.

As noted in Part 1, the front line in any dental office is the front desk staff. For the patient with a dental emergency, the front desk staff, the chairside assistant, and the dental hygienist need to be part of the team that assists the patient so suitable data can be collected and the clinician can make a reasonable assessment of the nature of the patient’s problem. For any dental office, a well-planned and well-executed triage of the patient’s condition and needs should be implemented. At any time, any

staff member can be greeting a patient with a dental emergency. As listed in Part 1 of this series, I have found that use of a patient questionnaire helps obtain important information for triaging the patient for their appointment in a timely manner. This form can be filled in by the patient or on the telephone by a staff member.

Although the description of the Emergency Phone Call form is repeated from Part 1, it is important that a dental office has a plan. This form contains questions that elicit the patient’s chief concern, a history of the problem, whether the problem is associated with acute or chronic pain, and if it needs immediate attention. From this form, the clinician can make a determination for patient scheduling and whether radiographs are needed to aid in assessing the problem.⁽¹⁾ Once the information has been gathered, decisions can be made.

DENTIN HYPERSENSITIVITY

Dentin hypersensitivity is a common patient complaint. While dentin hypersensitivity is also referred to as tooth sensitivity, root sensitivity, or just sensitivity, this condition is one that patients describe as sharp, short-lasting tooth pain.⁽²⁾ Dentin hypersensitivity can be characterized by a short, sharp pain arising from exposed dentin in response to stimuli, typically thermal, evaporative, tactile, osmotic or chemical, which does not appear to be due to any other form of dental defect or pathology.⁽³⁾ To the patient, this pain is a toothache. Even though dentin sensitivity is not an acute emergency that needs immediate attention, a patient experiencing the pain may feel that it needs immediate attention. A patient might be fearful of dentin or root sensitivity being a major problem with more significant dental implications.

As clinicians, we see dentin hypersensitivity as an exaggerated response to routine stimuli to teeth. Patients respond to dentin hypersensitivity when we dry a tooth with an air spray or scratch a tooth with the tip of an explorer. Some patients complain of pain when brushing their teeth or flossing. Although it causes no direct harm to the tooth, dentin, or pulp, it has all the criteria to be considered a true pain syndrome.⁽⁴⁾ Typically, the pain of dentin hypersensitivity is a sharp pain of very short duration that is triggered by stimulus. When the pain quickly dissipates, within 10 to 20 seconds, after the stimulus is removed. A pain of longer duration and not treatable with desensitizing agents may be the result of pulpal inflammation.⁽⁵⁾ Dentin hypersensitivity has been called one of the

most painful – and least successfully treated – chronic dental conditions of teeth.⁽⁶⁾

Before initiating any treatment, a definitive diagnosis must be made. In the case of dentin hypersensitivity, a diagnosis of root sensitivity can be made by using a gentle air spray from a trisyringe to elicit a response. This will help in the diagnosis of dentin hypersensitivity and identify the problematic tooth or teeth. If the sensitivity is in fact root sensitivity, it can be treated with in-office treatments, at-home sensitivity toothpastes, or a combination of the two. Root sensitivity is usually due to gingival recession leaving exposed roots. (Fig. 1)

In-office, professionally applied desensitizing agents can be applied at the time of the patient visit. Professionally applied agents include those that occlude and block the open dentin tubules (Sensodyne Chairside Solution, GlaxoSmithKline, Parsippany, NJ; and D/Sense Crystal, Centrix, Shelton, CT). These agents have been demonstrated to lower thermal sensitivity of teeth with dentin hypersensitivity.⁽⁷⁾ In some cases, the desensitizing agents are not surface blockers, but have a variety of active ingredients, including glutaraldehyde and other ingredients (Gluma Desensitizer, Heraeus-Kulzer, Purchase, NY; Desensitizer, Health Dent, Oswego, IL; and Dentin Desensitizer, Pulpdent, Boston, MA) that have been used successfully.⁽⁸⁻¹⁰⁾ In recent years, in-office, high-fluoride concentration varnishes (Duraphat, Colgate; AllSolutions, Dentsply Professional; 5% sodium varnish, Benco Dental; Enamel Pro, Premier; Omni Varnish 5% NaF, Omni Preventive Care) have been effective in treating dentin hypersensitivity.^(11, 12) The mode of action is most likely surface sealing with the chemical varnish and additional tubule occlusion by the high-concentration fluoride. Resin adhesives can also be used as root-desensitizing agents.

At-home treatment of root sensitivity using over-the-counter products is usually in the form of toothpastes. Since the use of an OTC product can be the most cost-effective for a patient to receive care, many people make the decision to try and continue using desensitizing toothpastes. The claim of desensitizing teeth with toothpaste is a therapeutic claim. It must be substantiated by clinical trials or the addition of an ingredient recognized as an effective agent for the treatment. The most popular ingredient for desensitizing toothpastes is potassium nitrate. According to the FDA monograph, in order for a toothpaste to be desensitizing, it must contain 5% potassium nitrate as an active ingredient.⁽¹³⁾ The mode of action of a 5%



potassium nitrate has been described as a penetration of the potassium ions through the tubules to the endings of the nerves, decreasing the excitability of these nerves.⁽¹⁴⁻¹⁶⁾

While root sensitivity is the most common cause of perceived dentin sensitivity, other causes include microleakage at a restoration interface or occlusal interferences. These conditions manifest with similar symptoms as root sensitivity. The treatment depends on the assessment and differential diagnosis. If a restoration or tooth has an occlusal interference, the treatment may be a limited occlusal adjustment. More extensive occlusal problems may require a thorough occlusal analysis to include the musculoskeletal system of the temporomandibular joint. Sensitivity due to restoration leakage can be treated with total restoration replacement or sealing the margins of the restoration using an acid-etch adhesive technique with a sealant. This adjunctive sealant placement can be done with composite resin and amalgam restorations.

In some cases, tooth sensitivity can be due to caries. A radiograph should be made. In most cases, the sensitivity from caries is not an acute problem. The patient can be appointed for restoration at a future visit. It is important to reassure the patient of the minor nature of the diagnosis. In some cases, the carious lesion may be more extensive and it may be necessary to put in a temporary restoration. In these cases, remove most or all of the caries with the use of local anesthesia and restore with either a glass ionomer restorative (e.g., Fuji IX, GC America, Alsip, IL) or a reinforced zinc oxide and eugenol provisional material (IRM, Dentsply-Caulk, Milford, DE). If the final restoration will be a composite resin, it is recommended that the glass ionomer be used because any residual eugenol can chemically interfere with polymerization of a resin adhesive and composite resin.

FRACTURED TEETH/RESTORATION

In Part 1, the traumatically fractured anterior tooth was addressed as a restorative emergency. Teeth

Figure 1: Maxillary right posterior quadrant with gingival recession and exposed root surfaces that have dentin hypersensitivity.

Figure 2: Fractured facial cusp of maxillary second premolar.



Figure 3 Air abrasion of amalgam and exposed dentin for emergency repair of fractured cusp



Figure 4 Bonding to the exposed amalgam and dentin with a 4-meta bonding resin (C and B Metabond)



Figure 5 Fracture cusp restored with nano-hybrid composite resin (Artiste)

and restorations can also fracture on posterior teeth. Depending on the restorative material and a patient's occlusion and oral habits, restorations have limited durability. Restorations on teeth with restorations can fracture. Although there is typically no acute pain when a cusp or restoration fractures, a patient could perceive the loss of the portion of a tooth or restoration to be catastrophic. Sometimes, the patient is not sure what happened, only knowing there is a hole in the tooth. To the patient, if this hole is not immediately treated, there is a potential for significant pain. While this is not typically the case, the patient needs reassurance and should be scheduled for assessment and diagnosis.

Restoration fractures can lead to several clinical outcomes: it can be lost from the tooth preparation, leaving a cavity present in the tooth; the fractured restoration can shift within the tooth preparation and cause rubbing on the dentin within the preparation, often perceived as dentin sensitivity and causing discomfort; or the restoration can fracture and shift, causing periodontal pain with the additional problem of food impaction and retention. This can

lead to gingival inflammation and bleeding. In some cases, restorations fracture due to recurrent caries. Whether or not a patient has caries, the symptoms, as perceived by the patient, are similar to dentin hypersensitivity.

In most cases, there is no immediate need to see the fractured restoration. The patient can be sched-

uled for a routine office visit. When a patient wants to be seen as soon as possible or the patient is a walk-in, the fractured restoration or tooth can be managed with the placement of a temporary restoration. The choice of restorative technique and material will depend on how much time is available in your schedule and the length of time the restoration will be in place. For many patients, smoothing the sharp fractured tooth or exposed margin of the restoration is sufficient until the patient is seen for replacement of the restoration.

A fractured cusp on a posterior tooth is a frequent cause for an emergency dental visit. (Fig. 2) In these cases, either a glass ionomer or an adhesive composite resin can be used to restore the cusp. For this patient, the fractured facial cusp of the maxillary premolar with MOD amalgam restoration was sharp and uncomfortable to the patient's cheek and tongue, unesthetic, and sensitive to air and cold beverages and foods. Time constraints for this emergency visit lead to the placement of an adhesive composite resin to restore the fractured cusp. As described in Part 1 of this series, surface treatments of metal and porcelain with air abrasion to microscopically roughen the surfaces to be repaired is beneficial.

Relatively inexpensive air-abrasion units, microetchers (MicroEtcher II, Danville Engineering; MiniBlaster, Benco), can be used to create a high-velocity stream of aluminum oxide particles that microscopically roughen both metal and tooth surfaces to prepare them for bonding. A less-expensive air-abrasion unit that can be used for crown and bridge repair, along with preparing teeth for resin restorations, is the RONDO Express (Kavo). It fits on the Kavo coupler for its high-speed handpiece and is a multiuse instrument.

The amalgam and exposed dentin were air-abraded using a RONDO Express unit. (Fig. 3) The amalgam and dentin were bonded using a 4-Meta metal and dentin adhesive cement (C and B Metabond, Parkell, Farmingdale, NY). (Fig. 4) The fractured cusp was restored with a light-cured, nano-hybrid composite resin (Artiste, Pentron Clinical, Wallingford, CT). (Fig. 5)

For an emergency visit, there are time constraints based on the existing patient schedule. The choice to remove and replace the entire restoration, or to repair the fractured tooth or restoration, will be based upon the time required to complete the job without it interfering with prescheduled appointments. If a repair

of the fracture is planned, it is important for adequate resistance and retention to be present to avoid the patient prematurely returning for replacement of a fractured or missing temporary restoration.

CROWN AND BRIDGE EMERGENCIES/ UNCEMENTED RESTORATIONS

The most commonly fixed prosthodontic emergencies involve the dislodgement or fracture of a resin, provisional restoration or all-metal, porcelain-metal, and all-ceramic definitive restoration. In Part 1 of this series, the use of composite resin to repair fractured porcelain was presented. When a crown or bridge comes off the tooth preparations, it is important to treat these cases as soon as possible. Loss of these restorations from crown preparations can lead to some of the same problems encountered when restorations or teeth fracture, including:

- 1 loss of positional stability of the tooth preparation. (17-20)
- 2 changes in the occlusal relationship between teeth.
- 3 tooth sensitivity due to exposed dentin.

In the case of a lost or fractured provisional crown, or a fixed partial denture, it is even more important to get the patient treated to fabricate a new temporary crown or recement the existing crown or bridge that has come off. Any movement of the crown preparation due to loss of the provisional restoration can lead to the need for a new impression. It could also result in the restoration being returned by the laboratory and still needing more adjustment before cementation.

If the temporary restoration has become dislodged and only needs to be recemented, evaluate the retention of the provisional restoration. In some cases, you know the temporary won't stay in place due to the preparation itself or because the patient doesn't follow instructions. In the cases where the likelihood of future loss of the restoration is possible, consider using a more rigid, provisional cement. (Hy-Bond Polycarboxylate Temporary Cement, Shofu or Durelon, 3M-ESPE).

If the temporary crown or fixed partial denture is fractured, a new provisional restoration must be made. If you have planned well, you will still have the template used for the original temporary restoration. For a single crown where you do not have a template, there is an innovative, prefabricated crown material and technique. (Protemp Crown, 3M-ESPE). Pro-

temp Crown is a light-cured, composite resin, preformed crown for a single-unit crown temporization of mandibular premolars and molars, maxillary premolars and molars, and canines. (Fig. 6)

It combines the advantages of composite-based temporization materials – that is, wear resistance, and esthetics – with the advantages of prefabricated crowns – that is, simple-to-use, no need for additional matrix, and easy cleanup. It can be customized and adapted in less than four minutes. (Fig. 7)

There are times an existing definitive crown or bridge restoration becomes uncemented. In this circumstance, the clinician should evaluate the tooth for caries or a fracture. Before trying to put the restoration back in place, the interior surfaces of the restoration should be cleaned of plaque and prior cement.

That is, proximal contacts, and occlusion also need to be evaluated for acceptability. It may be necessary to make a radiograph of the tooth and area before considering recementation of the restoration. If there are no problems noted, the crown or bridge can be recemented with a definitive, durable crown and bridge cement. If there is caries present, or the restoration does not have a clinically acceptable fit, the patient should be informed that the best course of treatment would be to remake that restoration.

For some patients, the expense, timing, or other reasons will not allow for the remake of a defective restoration. In these cases, it is important to inform the patient of that best course of treatment, noting the recommendation in the patient record, and then providing the patient with alternative treatments. I have the patient sign the clinic note describing the alternative treatments. If you will be reusing the crown or bridge to be placed back on the tooth, it is important to evaluate pulpal status, remove all existing caries, and correct any margins that are unsatisfactory within the limitations presented.

For crowns and bridges with poorly fitting margins, consideration can be given to recementing the restoration using a self-adhesive, composite-resin cement (UniCem, 3M-ESPE; Breeze, Pentron, Embrace Wetbond, Pulpdent,



Figure 6
Prefabricated
composite crown
(Protemp Crown)

MaxCem, Kerr). For restorations with large gaps between tooth and crown, roughen the interior of the crown with a medium-grit diamond and cement it back in place with an etch-and-rinse adhesive and dual-cure, composite-resin core material. After cementation, it is important to trim the margins to avoid any periodontal problems.

DENTURE EMERGENCIES

In a 2003 United States census survey of older adults, life expectancy was at 77.4 years, and 25% of the population 65 and older was edentulous, according to the U.S.

Department of Health and Services. This population of older adults is seeking dental care for the replacement of missing teeth with removable dentures. (21) Although implants and fixed partial dentures are desired by many patients as fixed replacements of missing teeth, some patients – due to anatomic considerations, systemic medical conditions, or cost – are making the decision to replace missing teeth with removable, partial dentures that are fabricated from processed, acrylic resin with cast-metal frameworks, or using wire clasps for retention. (1) Over time, the gingival tissues and teeth supporting these restorations change and soft tissue irritation may result.

Also, with use, these materials undergo stress and break. In some circumstances, these restorations are accidentally dropped and break, too. To the patient, a fractured denture that cannot be worn is a catastrophic event.

The bone and gingival tissues that support a denture are in a state of constant change. As the alveolus remodels, so does the adjacent soft tissues. In most cases, the soft tissue is the primary support of the complete or partial denture. As the soft tissue changes, the denture will have a different adaptation to the supporting ridges and soft tissue. This can lead to soft tissue ulcerations and sore spots. That will require denture adjustment or relining for patient comfort in function and for gingival and tooth health. In an emergency case, the denture should be evaluated using marking sticks and pencils, pressure-indicating pastes, or disclosing waxes to evaluate the condition and establish a diagnosis. In many cases, the denture can be adjusted by grinding the offending area to remove the interference. The adjusted area should then be polished. In some circumstances, a soft reline of the denture might be necessary (Coe-Soft or Coe Comfort, GC America; Lynal, Dentsply; Recon, Coltene/Whaledent; Dentusil Soft Reline, Bosworth; ez line soft, Benco). If adjustments and soft relines do not solve the problem, it may be necessary to remake the restoration.

LABORATORY DENTURE REPAIRS

When a complete or partial denture acrylic base breaks, the repair can be fixed in-office by the chair-side assistant or sent to the dental laboratory. In either case, the patient needs to understand that he or she will be without their denture for a time when it is being repaired. Some clinicians prefer to send the denture to the laboratory because the time needed to repair it would interfere with their regular schedule. If the restoration is sent to the laboratory for repair, it is important to provide the laboratory with a matrix of how the pieces fit together. One technique is to replace the fractured restoration in the mouth and make an impression with the restoration in place. It can then be sent to the laboratory. Also, for laboratory repairs, find out ahead of time what the cost will be and notify the patient of the total repair cost. It is not unusual to have a total fee of laboratory and office costs in the hundreds of dollars. To many of our older patients, that is a shock. In my office, I inform the patient of the office fee, plus the laboratory cost. Since many times I am not certain of the laboratory



Figure 7 A
Protemp Crown being fitted to molar crown preparation with PFI instrument.



Figure 7 B
Adjustment of margins of Protemp Crown



Figure 7 C
Protemp Crown in place.

cost, I make sure the patient understands the total fee basis. I will even make a copy of the laboratory invoice for the patient.

IN-OFFICE DENTURE REPAIRS

When a patient comes to the office with a broken denture, assess the degree of breakage and damage. In some cases, the damage is not repairable or has been repaired too many times in the past. If a complete denture is broken into two or three pieces, verify that the pieces fit together. Join the pieces together with sticky wax and lightly coat the undersurface of the denture with petroleum jelly. If there are any undercuts present in the denture base, block these out with red rope wax. Create a matrix to hold the pieces together by mixing a fast-set dental stone. Or if you have only regular-setting dental stone, mix it with a slurry water mix created by grinding on an existing stone cast. Pour the stone into the lubricated undersurface of the denture. When the stone has set, remove the denture from the matrix and remove the sticky wax. Using a straight, acrylic bur, make the fracture sites more pronounced and create space for the repair resin. Reverify the positioning of the denture pieces in the stone matrix. Use a pink, denture-repair, acrylic resin (Repair Material, Dentsply-Trubyte; Perm Reline and Repair Acrylic, Coltene-Whaledent; Jet Denture Repair, Lang Dental; Galaxy Acrylic Repair, Benco Dental). To accelerate and harden these self-cure, acrylic resins, place the repair in a pressure pot (Pressure Pot, Bosworth; Acri-Dense 6, GC America). Using a pressure pot for acrylic-resin repairs provides for a harder, denser, porous-free acrylic resin. (1) When the acrylic resin has set, it can be polished and tried in. As with any fitting of a denture, use a marking pencil or gentian violet stick to evaluate and eliminate any areas that are rubbing the soft tissues before dismissing the patient.

In some cases, a tooth will come apart from a denture. If you have the tooth, the same technique described above can be used to repair and replace the tooth. In those cases where the patient has lost the tooth, the denture will need to be sent to the laboratory for repair and replacement of the tooth with the correct mold and shade for the repaired tooth.

BROKEN PARTIAL DENTURE CLASPS AND METAL FRAMEWORKS

Over time, the cast metal of partial-denture clasps undergoes stress fatigue that can lead to a fracture of

the clasp. The loss of a clasp can lead to a loose-fitting partial denture that lacks stability for normal function of eating and speaking. When this happens, the practitioner has some choices. If the clasp is not critical to retention of the partial denture, but is now sharp to the patient's tongue or other soft tissues, it can be smoothed and polished. If the clasp is important to the retention of the partial denture, a clasp can be added by the laboratory to the partial denture. Although these added clasps are usually not as effective as the original clasp, they can add life to the restoration. To add a clasp, it will be necessary to send the entire partial denture to the laboratory. As described earlier, the partial denture would be inserted in the patient's mouth, making an impression with vinyl polysiloxane material.

The impression is removed and the partial denture is fully seated in the impression. The laboratory will pour a stone cast to make the repair. In circumstances when the partial denture clasp is critical for retention and function, it might be necessary to remake the restoration.

Although uncommon, there are times the major connector of the partial denture breaks. For these circumstances, a remake of the partial denture is the best choice. If a repair is desired, there are times the dental laboratory can solder the two pieces of the major connector together. Once again, a matrix joining the pieces would need to be made. This is best accomplished by making an impression with a VPS impression material while the partial denture is in place. When the laboratory solders the two pieces together, the heat of soldering usually requires the remake of the denture base and replacement of the teeth.

CONCLUSION

Restorative emergencies present themselves on a regular basis in dental practices. Both patients and staff appreciate a well-designed process to manage restorative emergencies. Although most restorative emergencies do not require immediate attention, patients are often upset and they usually want to speak or be seen by the dentist for reassurance. When the necessity for an office visit is determined after screening and assessment, the front desk staff must know how long a period of time may be necessary to manage the restorative emergency so they can schedule it appropriately. This two part series on management of restorative emergencies has attempted to provide the clinician with methods of triage and techniques for treating patients with restorative emergencies.

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1. The following are restorative dental emergencies EXCEPT:
 - A. fractured tooth
 - B. fractured restoration
 - C. periapical abscess
 - D. recement temporary crown
2. Dentine hypersensitivity can be characterized by:
 - A. dull, throbbing pain that lasts 1-2 hours
 - B. short-lasting, sharp pain
 - C. pain on chewing
 - D. short-lasting, throbbing pain that radiates from sinus
3. An in-office treatment of dentin hypersensitivity is:
 - A. adjustment of any non-working occlusal interferences
 - B. application of carbamide peroxide to the root surfaces of teeth
 - C. application of a desensitizing agent, e.g., Gluma Desensitizer, to the exposed roots of teeth
 - D. application of a polysiloxane to occlusal surfaces of restored teeth with restoration gaps
4. The mode of action of fluoride varnishes in the treatment of dentin hypersensitivity is:
 - A. surface sealing
 - B. repolarization of odontoblastic processes
 - C. deposition of phosphates on the open dentin tubules
 - D. numbing effect on the afferent nerve fibers
5. The active ingredient in over-the-counter desensitizing toothpastes is:
 - A. 10% calcium peroxide
 - B. 2.5% sodium perborate
 - C. 5% potassium nitrate
 - D. 12% sodium monophosphate fluoride
6. Glass ionomers should be used as a temporary restoration for a restorative dental emergency when a composite resin will be the definitive restoration during the next visit instead of a reinforced zinc oxide and eugenol (IRM) provisional material because:
 - A. eugenol can chemically interfere with polymerization of resin adhesive and composite resin
 - B. eugenol can cause pulpal hypersensitivity and inability to anesthetize the tooth next visit
 - C. zinc oxide is radiolucent and removal of all caries may be difficult to visualize on a radiograph next visit
 - D. zinc oxide and eugenol (IRM) is too white and will interfere with the composite resin esthetics
7. In many cases the fracture and loss of a restoration is not an acute restorative emergency that needs to be seen as soon as possible. When the patient calls the office and they are questioned about tooth pain, if there is no pain, they should be reassured that the "hole" in their tooth will usually not lead to severe tooth pain and need for root canal therapy.
 - A. True
 - B. False

8. **A fractured restoration can lead to several clinical outcomes which include:**
- loss of the entire restoration leaving a cavity in the tooth
 - the fractured restoration moves within the cavity preparation leading to rubbing of the dentin with dentin sensitivity and discomfort during function
 - the fractured restoration shifts and causes periodontal pain
 - all the above
9. **When a cusp fractures on a posterior tooth, it can be restored during the emergency visit with:**
- adhesive composite resin
 - glass ionomer
 - gold foil
 - a and b
10. **When a cusp fracture occurs leaving an exposed amalgam restoration and you want to restore the cusp and cover the amalgam and any exposed dentin, you can surface treat the amalgam to improve retention of the temporary restoration with:**
- air abrasion with a high velocity aluminum oxide particle
 - 35% hydrochloric acid
 - 22% polyeuronic acid
 - polishing with prophylaxis paste
11. **The RONDOflex device is:**
- used for colonoscopies
 - used for air inversion
 - used for water-laser, tooth preparation
 - used for air abrasion with aluminum oxide particles
12. **According to this article, when a restoration fractures, the decision to remove and replace the entire fractured restoration is usually based upon:**
- the time required to remove and replace the entire restoration without the length of appointment interfering with existing patients scheduled for appointments
 - what the patient's insurance plan covers
 - whether the patient will pay with a credit card or cash
13. **Loss of a temporary crown can lead to:**
- loss of positional stability of the tooth preparation
 - changes in the occlusal relationship between teeth
 - tooth sensitivity due to exposed dentin
 - all the above
14. **If a provisional crown or fixed partial denture is dislodged from the tooth preparation(s) or fractured after the impression appointment with the impression sent to the dental laboratory, not replacing the provisional restoration by recementation or fabricating a new provisional restoration can be problematic because:**
- the tooth that has been prepared for the crown or fixed partial denture can move and change position which can lead to the need for a new impression or more adjustment during the try-in and cementation appointment
 - the tooth or teeth will definitely need root canal therapy
 - the tooth or teeth will develop a periodontal abscess
 - the dentin of the tooth preparation will no longer be bondable with an adhesive cement
15. **In some cases a temporary crown won't stay in place due to lack of retention in the tooth crown preparation. One solution to retaining the temporary crown is to use:**
- a softer temporary cement to be gentler on the exposed dentin
 - a flexible temporary cement that provides better cushioning between the crown preparation and the temporary crown
 - a more rigid provisional cement to improve retention
 - a temporary cement with a desensitizing agent so that when the crown comes off the tooth will not be sensitive
16. **When a definitive crown restoration comes off a tooth preparation and needs to be recemented, the interior of the crown should be _____ before trying it back in to evaluate.**
- acid etched
 - surface primed
 - cleaned of any prior cement
 - disinfected and autoclaved
17. **Before recementing a definitive crown restoration, the tooth preparation should be evaluated for:**
- fit of margins
 - fit of proximal contacts
 - occlusion with opposing teeth
 - all the above
18. **When a definitive crown comes off a tooth preparation, the tooth preparation should be evaluated for:**
- caries
 - odontogenic tumors
 - fracture
 - a and c
19. **If the patient presents with a soft tissue ulcer beneath an existing complete denture, the clinician can:**
- mark the ulcer with a marking stick or pencil to evaluate the interior of the denture for adjustment
 - apply pressure indicating paste to evaluate the adaptation of the denture
 - apply disclosing wax to evaluate the adaptation of the denture
 - all the above
20. **When repairing a complete denture that has broken into two or three pieces in your dental office, it is valuable to join the pieces together with sticky wax and lightly coat the undersurface of the denture with petroleum jelly. If there are undercuts in the denture, block them out with wax before creating a matrix made from fast setting dental stone to hold and stabilize the pieces together before starting the repair.**
- True
 - False

Managing Restorative Emergencies: Part 2 of 2
Continuing Dental Education Course
 Order number [4004-220]

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