

Anterior CEREC CAD/CAM Porcelain Treatment of GERD Eroded Teeth



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Abstract

Erosion and worn teeth are an every day occurrence in dental practice. Gastroesophageal reflux disease (GERD) is a common condition where acid is regurgitated from the stomach into the esophagus and then to the oral cavity, which can lead to dental erosion. Critical to the long-term success of the restorative treatment is proper diagnosis and medical control so that enamel replacement will be successful. Single visit computer-aided design/computer-aided manufacturing all-porcelain restorations were placed in this case to meet functional and esthetic needs after medical control of the regurgitation had been achieved.

Learning Objectives

After reading this article, the reader should be able to:

- identify patient history and erosion patterns characteristic of intrinsic gastric reflux disease.
- discuss computer aided design/computer aided manufacturing treatment advantages, sequences, and techniques for restoring eroded anterior teeth.
- explain ways to characterize CEREC porcelain to meet esthetic demands.

It is natural for a clinician to see a case of tooth degradation and begin treating it without first determining what caused the degradation. Sometimes, identification and correction of the cause is more important than repairing the tooth damage. Worn, short, discolored teeth are commonly seen in the dental office and bruxism is often the first etiology suspected, without consideration for other factors that may make the tooth more susceptible to wear.

Erosion of dental structures is often a common component of enamel and dentin loss, and identifying its cause is as important as correcting the tooth degradation.¹ Anorexia and bulimia nervosa, chronic alcoholism, and gastric disturbances are some of the conditions in which acids from the stomach can cause dental erosion. There is also a correlation between tooth erosion and gastroesophageal reflux disease (GERD).²

This case describes the etiology and medical co-therapy needed with a focus on restoring the eroded enamel of the anterior dentition with computer-aided design/computer-aided manufacturing (CAD/CAM) single-visit veneers.

Etiology

GERD is a chronic condition whereby acids travel from the stomach through the esophagus and into the mouth because of a faulty sealing by the lower esophageal sphincter.³ Gastric juices that travel upward toward the esophagus and low pH levels can cause esophageal irritation with the classic heartburn sensation.

Many people have acid backup into the esophagus, but in GERD patients this acidic fluid may stay in the esophagus long enough to cause erosion of the lining.⁴ Chronic acid reflux can cause epithelial changes in the lining of the esophagus resulting in a potentially precancerous condition called Barrett's esophagus.⁵ Should this acid regurgitate to the mouth, erosion of the teeth is possible.

Gravity, swallowing, and saliva are the most important protective mechanisms against this condition. The greatest amount of tissue damage occurs during sleep because the supine position allows the secretions

to spend more time in the mouth. Because swallowing and saliva secretions are also reduced, it is more likely that acid may remain in the esophagus for extended periods leading to dental and soft-tissue damage.

GERD should be suspected when there is excessive occlusal wear combined with lingual erosion, incisal wear, and oral malodor.⁶ Enamel wear tends to be more prevalent on the lingual surfaces in acid regurgitation conditions like GERD or bulimia nervosa as opposed to facial enamel wear seen from consumption of acidic foods and drinks.⁷ Patients may self-medicate with antacids to help deal with symptoms. These signs also may be prevalent in children along with potentially more dental caries.⁸

A thorough history may reveal heartburn, belching, sore throat, swallowing difficulty, sour taste, or stomach problems 2 to 3 days a week for several months.⁹ However, this condition frequently is asymptomatic, and the only evidence may be the irreversible erosion of tooth structure.¹⁰ The dentist is often the first health care professional to suspect this medical condition because of the affected dentition. Despite the ability to repair most any tooth degradation with modern dentistry, the best efforts can fail if the cause of the problem is not addressed.¹¹ The dental community can be helpful in its diagnosis and referral for treatment.¹² Characteristics or symptoms often seen in patients with GERD are:

- Excessive lingual cervical enamel wear
- Incisal or occlusal wear with erosion

“GERD should be suspected when there is excessive occlusal wear combined with lingual erosion, incisal wear, and oral malodor.”

- Occasional or chronic “heartburn”
- Use of over-the-counter antacids
- Frequent belching
- Difficulty in swallowing or sore throat
- Sour or bitter taste
- Bad breath
- History of stomach problems.

These clinical signs should alert the dental team that there may be a medical component to the dental attrition and a thorough medical history with prudent questioning about the presence of heartburn, bad taste or breath, stomach problems, or throat irritations should be done when dental erosion is obvious.^{13,14}

A thorough health history should be completed and a consult with a primary care physician, internist, or gastroenterologist should be considered when these signs and symptoms are present.¹⁵ Persistence by the dental team may result in correct medical intervention and treatment of this condition.¹⁶ Only after consultation, ruling out eating disorders, and control of intra-oral acid should clinical dental procedures move from maintenance to restoration.¹⁷

CAD/CAM CEREC Restorations

There are many porcelain restorative materials, with or without metal, that are esthetically pleasing and have the strength to replace missing enamel. Procera (Nobel Biocare), OPC (Pentron), InCeram (Vident), and others have proved suitable for

this purpose. Porcelain choice today often is determined by the clinician’s comfort and experience with the material.¹⁸

There are 2 porcelain choices for tooth colored CEREC restorations: Vita Mark II (Vident) and ProCAD (Ivoclar Vivadent). Both have the ability to be stained and glazed and have proven to be durable, cost effective, and very esthetic restorations for full porcelain coverage.¹⁹

The mean survival rate for milled CAD/CAM all-porcelain restorations has been reported at a greater than 97% success rate for nearly 5 years, which is comparable to other all-ceramic systems.¹⁸ Wear rates for these materials are very similar to natural enamel, which minimizes iatrogenic abrasion of the opposing teeth.²⁰

With experience, esthetic anterior restorations can be created in 1 appointment particularly if the team has the ability to stain and glaze the restorations. Further customization can be achieved by cutting back and adding translucency or custom shade variations of porcelain, or by using blocks with varying porcelain translucency. It must be stressed that doing single appointment CEREC restorations can be an esthetic compromise when compared to the experienced lab technician who works with porcelain customization on a daily basis. Model work, cutting back porcelain after milling, stacking, and customization of porcelain require time, experience, and a thor-

ough understanding of the material. In this case, time and finances were factors in the material and technique selection. Some advantages of CEREC anterior restorations are:

- Efficient design and fabrication
- Tooth morphology controlled by the clinician
- No need for temporary fabrication or problems
- No lab fees and minimal supply costs
- No bacterial accumulation on preparation during temporary phase
- Excellent adaptation of porcelain to tooth
- Ability to be stained or glazed quickly
- Wear similar to natural teeth.

Because the restorations are

made directly by acquiring a preoperative image of the mock-up and then an image of the prepared teeth, there is no need for final impressions, temporary fabrication, temporary removal, or a second appointment for cementation. This reduces the number of appointments and lab fees as well as sensitivity occasionally associated with temporary wear. Immediate dentin sealing with dual-cure bonding and luting agents may increase dentinal bond strengths, decrease marginal gap formations, reduce bacterial microleakage, and cause less dentinal sensitivity than placing provisionals on nonbonded teeth.²¹

There are also some disadvantages when using CEREC for multiple anterior teeth. The office team is responsible for fit, shading, shaping,

and customization of the porcelain. Despite only being 1 appointment, as much as or even more total chair time is needed than traditional porcelain techniques. Generally the time needed for an office to do anterior work with 1 milling machine is about 1 hour for patient involvement, mock-up, and anesthesia, plus about 30 minutes per tooth being restored.

Case Presentation

A 20-year-old man with advanced incisal wear was concerned about the wear of the incisors, dark tooth color, and shortness of the front teeth (Figure 1). He wanted whiter teeth that were longer, straighter, and more indicative of his age (Figure 2).

In the past, he had been given a bruxism splint because of nocturnal grinding. There were obvious signs of parafunctional incisal wear; a loss of 2 mm to 4 mm of tooth length was generalized and the smile showed less tooth structure than the patient liked (Figure 3). Facial erosion without decay was prominent in both arches and the maxillary incisors (teeth Nos. 8 and 9) showed little facial wear (Figure 4). Erosion was noted on the lingual of teeth Nos. 3, 14, and 19 and was particularly evident on the lingual of the upper incisors with incisal edge concavities along with rotated teeth and crowding (Figure 5).

The patient experienced no pain in his teeth but recently had noticed an increase in cold sensitivity. There was no periapical pathology or any periodontal concerns with oral exam or radiographs. There was interproximal decay between some of the max-



Figure 1—Preoperative full-face smile with what patient feels are dark, worn teeth.



Figure 2—Facial abfraction and erosion areas show and make teeth appear darker.



Figure 3—Left smile indicates a “hiding” of the teeth as the patient refuses to give a full smile because of unhappiness with teeth.



Figure 4—The color of the teeth is near A2 in the incisal and A3.5 in gingival. Gingival heights are uneven and inflammation is present near abfraction areas of laterals.

illary anterior teeth with loss of almost all lingual enamel (Figure 6).

Differential Diagnosis and Medical Treatment

The history of a bruxism habit was consistent with incisal wear, occlusal enamel loss, and abfraction.²² Because of the erosive wear patterns, lack of chronic acidic food history, and patient history, intrinsic acid regurgitation was suspected over an extrinsic consumed source.^{23,24} There was no history of any reflux pathology although the patient complained of a “bad taste” and “bad breath.” He was first referred to a primary care physician by this office only to return without any diagnosis of reflux pathology or treatment for any reflux condition.

Months later, a consult with a gastroenterologist revealed chronic acid regurgitation and the patient was prescribed ranitidine to treat GERD. The medication was later changed to esomeprazole and the symptoms of heartburn, acidic taste, and belching were mostly eradicated. The patient was also later diagnosed and treated for ulcerative colitis by the same specialist after further testing.

Restorative Plan

Once the regurgitation was under medical control, a treatment plan was made that addressed the missing enamel, interproximal decay, and esthetic concerns. An “ideal” plan would have been to replace missing enamel on all teeth as soon as the reflux was controlled. However, because of finances, time, and patient cosmetic desires, treatment was to be

done in stages over several years. Composites, lab-made porcelain veneers, and in-office CAD/CAM porcelain restorations were considered for replacing missing enamel to cover and protect exposed dentin.²⁵

For over 20 years, porcelain veneers have been used to replace missing enamel and to make cosmetic smile enhancements.²⁶ Porcelain has long been accepted for long-term restorations for missing tooth structure as as gingival anatomy, tooth morphology, function, and occlusion are all considered and incorporated into preparation design. This along with a controlled medical condition can lead to esthetic restorations with excellent long-term results.²⁷⁻³⁰

Enamel bonding is predictable, effective, and long-lasting while bonding to dentin is also clinically viable in the right circumstances with bond strengths approaching those achieved on enamel.^{31,32} The treatment plan was formulated to provide anterior dentin coverage with porcelain margins on enamel when possible.

Laser gingivoplasty was planned to correct inconsistent tooth lengths and to reduce the appearance of a gummy smile, allowing the fabrication of teeth that were proportional in length with consistent gingival architecture. Gingival enhancements were then done to teeth Nos. 4 and 12. The pocket depths were measured to 2 mm to 3.5 mm and would be recontoured with critical attention paid to preserve biologic width for a healthy, long-term result.³³

In this case, the posterior facial abfraction areas on both the lingual and facial of the molars were first restored with direct composite res-

torations to cover exposed dentin. There was also some occlusal pitting that was restored as well. The bite was deemed stable and the patient had good function with no obvious mandibular joint concerns. Once these areas were stabilized, the chief complaint of the anterior teeth was addressed.

Preview of Smile Rehabilitation

A direct composite mock-up was done without anesthesia so that speech and facial movements were not compromised by numbing. The mock-up was done for several reasons: so the patient could see a rough preview before being numb; so phonetics, function, and esthetics could be evaluated; and so the anatomy could be closely copied into the CAD/CAM restorations.

The teeth were etched with 37% phosphoric acid to make sure the materials would stay attached during CEREC fabrication. To allow for easy interproximal removal, bonding agent was not applied. An anterior hybrid shade B1 was quickly placed by finger molding and plastic instrument into a rough, overcontoured form of the desired shape (Matrixx AH, Discus Dental). The patient and assistant both chose Vita shade 1M1 (Vident) and so a similar shaded composite was used for a patient preview.

All exposed dentin was covered and incisal edges were added so that the teeth were roughly 70% to 80% as wide as they were tall to meet current accepted esthetic standards. A slightly over-bulked, between 0.5 mm and 1.0mm over-contoured, mock-up for CEREC correlation was desirable to allow for customized

anatomy placement after milling was completed. A basic facial contour was made with particular attention to incisal edge length and facial position (Figure 7). The mock-up surface irregularities were easily corrected in the CEREC design process. The clinical advantages of a direct composite mock-up are:

1. The patient can see a rough “preview” of basic shape
2. Approximate shade can be approved by patient
3. Can check basic phonetics
4. Can evaluate smile line and incisal edge placement
5. It will act as a bonded “reduction guide” during tooth preparation
6. The basic shape will be copied and applied to the final CEREC porcelain shape using “correla-

tion” design mode.

Restorative Procedure

After isolation with a SeeMore 4-way retractor (Discus Dental), a glycerin based dusting adhesive and a titanium dioxide reflective medium were applied to the tooth and the adjacent teeth (Figure 8). This mock-up image was then acquired by the CEREC 3D acquisition unit in Correlation design mode, which accurately copies the anatomy of the preoperative tooth into the milled porcelain. Tooth No. 8 was chosen first because it is helpful in CEREC design to have a central incisor as a benchmark for correct cant, size, and midline.

The mock-up material was then removed with a coarse diamond and a rounded chamfer was placed slight-

ly subgingival on the facial and extended around the tooth to cover all exposed dentin and ending on enamel wherever possible. As with most porcelain restorations, care was taken to make sure there were no sharp corners that might impart stress points within the final porcelain restoration. A reduction of 1.5 mm to 2.0 mm on the buccal and lingual was prepared from the extensions of the mock-up to provide ample porcelain thickness (Figure 9).

The preparation was then powdered and imaged (Figure 10). Design was completed in about 3 minutes in Correlation mode and the milling time was about 15 minutes per tooth. Every other tooth was done so that neighboring anatomy could be used to correlate the preop-



Figure 5—Wear of incisal edges consistent with history of bruxism and the acidic condition of the mouth may speed up this parafunctional wear.



Figure 6—Loss of lingual enamel on incisors is consistent with acid regurgitation conditions such as bulimia, anorexia nervosa, and GERD.



Figure 7—The mock-up was finished in just a few minutes and basic contouring was done with a finish bur.

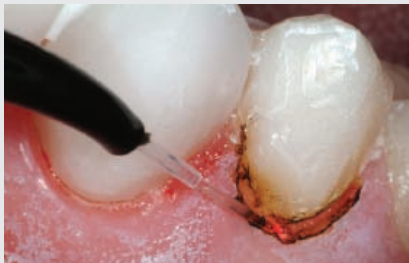


Figure 8—A titanium dioxide reflective medium will be applied to the mock-up so that the computer will copy the tooth morphology.



Figure 9—A 1.5 mm to 2.0 mm reduction is done to cover exposed dentin, decay, and restored areas.



Figure 10—Reflective powder is applied to the prep and imaged into the computer.

erative and postoperative images to allow porcelain to be consistent with the mock-up. While tooth No. 8 was being milled, tooth No. 6 was preoperatively scanned, prepared, and re-scanned in the same fashion. In about the same time it takes to mill a restoration, the next tooth was prepared, powdered, imaged, and designed. In that fashion, the milling machine seldom stops because when one is finished, another is started.

While milling tooth No. 6, a diode laser (Odyssey, Ivoclar Vivadent) was used to recontour gingiva and add crown length and a more symmetrical gingival architecture to teeth Nos. 5, 9, and 12. Pocket depths were measured, marked, and then contoured for preservation of the biological width (Figure 11).³⁴

The recontoured gingiva was wiped with hydrogen peroxide and gently scrubbed (Figure 12).

As each restoration was milled, it was tried-in and used as a benchmark correlation for design of the neighboring tooth. An “every other” tooth method allows the clinician to maintain landmarks for the CEREC copying and to help maintain contours relative to the mock-up. For example, after teeth Nos. 6 and 8 were done being milled, they were tried-in and only contacts were adjusted (Figure 13). This provided adjacent porcelain similar to the mock-ups, which could then be powdered and put into the computer so that tooth No. 7 could be copied (Figure 14). Preparation on the lingual was carried onto healthy, uneroded enamel and finished as

described to allow 1.5 mm to 2.0 mm of clearance for porcelain strength.

While the bicuspid were milled, the anterior 6 were placed and held with a nonmatching flowable composite interproximally (Figure 15). This was easily identified for removal later. Anatomical adjustments were made with a Gold Finish diamond (Diatech) and high-speed handpiece with copious water. Facial contours were made so that 3 planes—gingival third, middle third, incisal third—were evident to give a less bulky appearance. Likewise the first bicuspid were shaped and refined as milling was completed.

An office-made, hard/soft bruxism splint (Erkoloc Pro, Glidewell Laboratories) was made to help the porcelain survive potential parafunc-



Figure 11—While milling, a diode laser is used to add length to several teeth while making gingiva more even in height.



Figure 12—The areas of gingivoplasty will be cleaned with peroxide and a microbrush.



Figure 13—With the mock-up still on tooth No. 7, the milled porcelain is tried on teeth Nos. 6 and 8 and used for the correlation design of tooth No. 7.



Figure 14—With porcelain duplications of the mock-ups, the mock-up for tooth No. 7 is imaged into the computer before prepping.



Figure 15—While the bicuspid are milling, the anterior porcelain is tried-in and held in place with a nonmatching flowable applied interproximally.



Figure 16—At 1 week postoperative, tissues were healing very well and sensitivity was minimal.

tional habits. An alginate was taken during the try-in so that the splint could be made during porcelain customization. Because of the possibility of acidic regurgitation, the patient was also given a topical fluoride gel to place in the bruxism splint at night in an effort to help control any possible acid attack.³⁵ It must be noted that it may be harmful to the enamel to give a bruxism splint to a patient who has uncontrolled acid reflux because the splint may act as a reservoir for regurgitated acid leading to more tooth destruction.

Customization

The CEREC Vita Blocs are 1 color and there are several ways to give a more natural appearance of shade variation within the restora-

tion. Because the porcelain has some translucency, the incisal third will have a different look than the gingival third simply because there is no natural tooth under the restoration in that area. There is also the potential to control shade variations by using luting agents of a different shade and opacities when bonding the restoration.

Custom staining and glazing can also be done while cutback and addition of character porcelain takes more time. In this case, several shades of stain were used to provide a more natural appearance. A bluish stain was added in small amounts on the lingual of the incisal edges to mimic translucency and a white stain was added in the incisal areas to mimic hypocalcified areas often seen

in young teeth. These character additions are done according to the discretion of the staff and the desires of the patient.

The staining and glazing was done in a single bake in about 25 minutes with cooling, providing a more natural appearance and a surface that may reduce opposing tooth wear. Glazing may also reduce craze line development from milling scratches that could lead to subsequent porcelain fracture.³⁶ Care must be taken to evaluate the degree of surface gloss that is desired and is controlled by porcelain finishing, glaze thickness, and furnace holding time.

The porcelain was etched with hydrofluoric acid for 2 minutes and silane was applied. After air drying, a dual cure bonding agent (Cabrio,



Figure 17—Slight inflammation on lateral because of laser treatment and cement left from cementation.



Figure 18—After 2 years the smile improvements are obvious.



Figure 19—Color and length changes were well tolerated and appreciated by the patient and with time, the restorations are providing durable service while the GERD is controlled.



Figure 20—Tissue response has been excellent and CEREC characterization has been stable.



Figure 21—Lower incisor straightening was done during this period and composites and porcelain were placed to maintain occlusion.



Figure 22—The patient now smiles much more freely without coercion to show teeth.

Discus Dental) was mixed and applied. Insure Yellow Red Light dual cure cement (Cosmedent) was mixed and loaded into the restorations and then placed on the teeth. Cleanup was done with brushes, scalers, floss, and gauze and then cured. The restorations were cemented and cleaned up 5 hours after starting.

Healing and Follow-up

After 1 week, tissues were healing well in the areas of laser refinement and the color, shape, and size were accepted by the patient (Figure 16). At this stage there was slight inflammation remaining in the tissue and there was cement left interproximally and subgingivally that was removed with a composite knife and scaler (Figure 17).

During the next 2 years, healing stabilized and the patient was very pleased with the results; there was a much improved smile and confidence in appearance (Figure 18). The tissues remained healthy and home care improved with time. There were no obvious signs of regurgitation and the patient was still under physician care with medication for GERD (Figures 19 and 20).

During that 2-year period, orthodontic treatment was done on the lower incisors to correct crowding and composites were placed on the lower incisors with “transitional” CEREC porcelain placed on the lower cuspids and first bicuspid to maintain the occlusion (Figure 21). The treatment plan includes doing porcelain coverage on the posterior teeth as time and finances become available, but the composites are holding up well while the reflux is

controlled. The enhanced smile is evident from right and left lateral views showing esthetically pleasing results with good function.

The smile improvement was well worth the time and effort by the patient and he is very happy with the results, which is the overall final evaluation of any case (Figure 22).

Conclusion

Gastroesophageal reflux disease is widespread and must be an etiological consideration in many erosion and wear cases. CEREC 3D is most efficient for doing posterior dentistry but is capable of doing quality anterior restorations as long as the staff is committed to the time and detail that is required. Even though this work was done in 1 appointment, faster is not always better if postoperative complications, staff stress, or patient dissatisfaction arises.

The porcelain customization allows for an esthetically pleasing result and CEREC Vita porcelain has provided a suitable enamel replacement, and given an environment for periodontal health. The prognosis is good for the long-term success of these restorations because medical, periodontal, and esthetic concerns were addressed. As patient time and resources permit, cosmetic enhancements will be made to other teeth to complete the smile reconstruction and to cover missing enamel. ©

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Location: Charleston, South Carolina
Phone: 800.222.1851
Web site: www.diatechusa.com

Product: Erkoloc Pro
Manufacturer: Glidewell Laboratories
Location: Newport Beach, California
Phone: 800.854.7256
Web site: www.glidewell-lab.com

Product: Insure Yellow Red Light dual cure cement
Manufacturer: Cosmedent
Location: Chicago, Illinois
Phone: 800.621.6729
Web site: www.cosmedent.com

CONTINUING EDUCATION QUIZ: DECEMBER 2006

Instructions

Contemporary Esthetics offers 12 Continuing Education (CE) credit hours per year. Each clinical CE article is followed by a 10-question, multiple-choice test, providing 1 hour of credit. To receive credit, record your answers on the enclosed answer sheet or submit them on a separate piece of paper. You may also phone your answers in to 888.596.4605, or fax them to 703.404.1801. Be sure to include your name, address, phone number, Social Security number, and method of payment. The deadline for submission of quizzes is 12 months after the date of publication. Participants must attain a score of 70% on each quiz to receive credit. To register, call 888.596.4605. Participants are urged to contact their state registry boards for special CE requirements.

1. Which of the following conditions can cause dental erosion because of acids from the stomach?
 - a. anorexia
 - b. bulimia
 - c. chronic alcoholism
 - d. all of the above
2. Gastroesophageal reflux disease (GERD) is:
 - a. a chronic condition whereby acids travel from the stomach through the esophagus and into the mouth because of a faulty sealing by the lower esophageal sphincter.
 - b. an erosive condition caused mainly by acidi drinks and foods.
 - c. a medical condition for which there is no treatment.
 - d. an elusive diagnosis and has no effect on dental diagnosis and treatment.
3. GERD should be suspected when there is excessive occlusal wear combined with:
 - a. lingual erosion
 - b. incisal wear
 - c. oral malodor
 - d. all of the above
4. GERD is frequently asymptomatic and the only evidence may be:
 - a. heart burn.
 - b. irreversible erosion of tooth structure.
 - c. oral malodor.
 - d. insomnia.
5. Characteristics or symptoms often seen in patients with GERD are:
 - a. excessive lingual cervical enamel wear.
 - b. occasional or chronic "heart burn."
 - c. frequent belching.
 - d. all of the above
6. The mean survival rate for milled CAD/CAM all-porcelain restorations has been reported at a greater than 97% success rate for nearly:
 - a. 1 year.
 - b. 3 years.
 - c. 5 years.
 - d. 7 years.
7. Which of the following is an advantage of CEREC anterior restorations?
 - a. Tooth morphology controlled by the manufacturer.
 - b. No bacterial accumulation on preparation during temporary phase.
 - c. Ability to be stained over a period of time.
 - d. Minimal lab fees.
8. Generally, the time needed for an office to do anterior work with 1 milling machine is about 1 hour for patient involvement, mock-up, and anesthesia, plus how long per tooth being restored?
 - a. 15 minutes
 - b. 30 minutes
 - c. 1 hour
 - d. 90 minutes
9. Porcelain has been accepted for long-term restorations for missing tooth structure as long as which of the following are incorporated into the preparation design?
 - a. gingival anatomy
 - b. tooth morphology
 - c. function
 - d. all of the above
10. Which of the following is a clinical advantage of a direct composite mock-up?
 - a. The patient will not have to see a rough "pre-view" of the basic shape.
 - b. The patient will not need to approve the approximate shade.
 - c. Basic phonetics can be checked.
 - d. Smile line and incisal edge placement does not need to be evaluated.

