Polishing Considerations *for All-Ceramic Restorations*

A Brief Discussion on the Need for Varying Prophylaxis Protocols

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Introduction

Practicing dentistry is not an easy task! Balancing the routine of daily patient treatment with all the requirements to run a successful business demands constant cerebration and a desire to always do what is best to improve the patient experience. At regular intervals, in this process of the daily routine in a restorative practice, we need to re-evaluate *what* we are doing and *why* we are doing it. Are we employing the most current and proven dental materials? Are we implemented them in a way that ensures restorative predictability? Are we paying attention to understanding the details that must be incorporated into treatment planning, restoration fabrication (aesthetics and occlusion) and delivery, and then to the ongoing health and aesthetic maintenance issues that can have a dramatic impact on the long-term outcome for the patient?

All this seems so elementary, doesn't it? OK then, let's look at the topic at hand, the "routine" polishing protocol, as just one part of the dental prophylaxis. Then, after reviewing the following information, you and your dental treatment team can review your own prophy protocol. It may be time to determine if the steps that are routinely followed in your office have been given the thoughtful evaluation required, especially in light of the many new composite resin and all-ceramic dental materials that are now being used in most modern restorative practices.

On Prophy/Polishing Procedures in General

Doctors and dental hygienists should always be concerned about the risk of damage to teeth due to instrumentation and, when polishing teeth, especially those with composite and/or porcelain restorations. The goal in any practice setting is to use materials/techniques for any *necessary* polishing procedures that will minimize undue wear of the tooth surface; and yet effectively remove stain, plaque, calculus, and any other disease-related substances.

According to the American Dental Hygienists Association (ADHA), polishing should *not be considered simply a routine procedure*. In addition, it should be offered *only when a dental hygienist or dentist determines a specific need for it*.[1] The ADHA states that there is "minimal therapeutic benefit" as a result of polishing. Prevention of disease, as "prophylaxis" is defined, is achievable in the majority of patients without polishing; this is because stain and rough surfaces are not always present; which is especially true with all-ceramic restorations of all types, including the currently popular material choices of zirconia and lithium disilicate, whether glazed or not glazed (properly polished by the lab team or after adjustments by the doctor). Furthermore, scaling is the required clinical technique to remove calculus, and plaque and other tooth surface debris can be effectively removed by proper tooth brushing.

Guidelines for Prophylaxis of Glazed All-Ceramics

Let's assume you have patients that have been restored in your own practice, or perhaps they have had all-ceramic work done under another doctor's care (Figure 1) and then transferred into your practice for continued care. Regardless of the circumstances, our patients under our supervision and care need to be treated in a way that creates no (or the very least possible) harm to the surface gloss and luster of any existing all-ceramic restorations. Whether they have just one glazed monolithic or layered lithium disilicate crown (such as IPS e.max [Ivoclar Vivadent]; or 2 or 3 glazed layered or monolithic zirconia crowns (such as Lava or Lava Plus [3M ESPE]); or 6 anterior pressed and microlayered and glazed lithium disilicate (IPS e.max) or leucite-reinforced (such as IPS Empress Esthetic [Ivoclar Vivadent]) porcelain veneers; etc.; certain guidelines related to prohylaxis for proper and non-destructive long-term maintenance should be implemented and followed.

Figures 1 and 2 – This patient had a complete full-mouth restorative rehabilitation in glazed all-ceramic (IPS e.max CAD [Ivoclar Vivadent]) restorations. If he came into your office for a new patient examination, and a routine prophylaxis was indicated; would you or your hygienist schedule a prophylaxis that includes a full-mouth polishing procedure using your usual [medium or coarse?] prophy paste? (Reprinted with permission of Dentistry Today; clinical work by Dr. Ara Nazarian)

Routine and regular polishing at recare appointments, by using abrasive prophy pastes on high-gloss ceramic surfaces, should be avoided. Over time, the use of these pastes may abrade and roughen the ceramic glaze placed over many all-ceramics. (Note: In most practices, course pastes are routinely used because they are perceived to clean faster and better.) Prophy pastes can also contribute to the breakdown of resin-luting cements at the margins of ceramic veneers and onlays. In addition, it is important for the dental team to inform their patients to stay away from any highly abrasive toothpastes as a part of the daily homecare regimen.

Ultrasonic scalers are often employed to make hygiene procedures faster and easier, but realize that this technology can damage certain all-ceramic restorations. Take great care when using an ultrasonic scaler around the fragile margins and bonded porcelain-cement-tooth interfaces of any all-ceramic restoration, especially bonded veneers (such as leucite reinforced and/or lithium disilicate/feldspathic porcelains).[2] Settings that are too high (aggressive) or unltrasonic energy left in contact too long in any one area can be highly destructive to the long-term integrity of the restoration.

Employing a less aggressive stain removal technique and educating the patient on preventing common stains is important. When routinely using any prophy pastes during the long-term use in cleaning and the maintenance of composite resin and all-ceramic restorations, the clinical protocol should include the of use a fine grit prohy paste that has been proven to be the most gentle possible. Furthermore, it must still be effective for the removal of any particular stain. Other techniques and technologies used for certain stain removal needs (ie Prophy Jet) should also be considered.

Polishing also removes the surface layer of the tooth, thus reducing any desirable fluoride content. Furthermore, enamel absorbs fluoride applied professionally in the dental office equally as well without polishing as with polishing. It is also important to be aware of the potentially negative consequences in using acidulated fluoride rinses or pastes on certain restorations.[3] Acidulated fluoride (unlike sodium fluoride) can cause surface etching/roughness on glazed ceramic surfaces, resulting in increased staining and decreased luster. It is important to use only a neutral fluoride in patients with *glazed* all-ceramic restorations. One exception within the

Figure 3 – Proxyt Polishing Pastes (Ivoclar Vivadent) *Note: Only the fine grit is recommended for polished composite resin and, if the clinician feels polishing is absolutely necessary, for glazed or polished all-ceramic restorations.*

modern all-ceramic material category would be polished (*not* glazed) monolithic (also referred to as full-contour or solid) zirconia restorations.

On Prophy Pastes

There are many polishing pastes available today, and their content and effects can vary. It is important to recognize that not all prophy pastes are the same and, although somewhat counterintuitive, the finer grit product can be nearly as destructive to a polished surface as the course grit.

Several studies compared the effects of various prophy pastes and grits on polished composite resin surfaces and ceramics.[4,5,6] These studies demonstrated that the effects of prophy pastes vary and are not necessarily predictable when considering the fineness or coarseness of the grit as it relates to surface damage. For example, in one of the studies using polished composite resin disks (IPS Empress Direct [Ivoclar Vivadent]) it was found that a specific fine grit prophy paste was as destructive to a polished surface as the course grit version of the same brand.[3] These studies in clearly demonstrate that there are differences in prophy pastes that should be evaluated by your own dental office team when making buying decisions for your hygiene department. For example, one notable fine grit paste (Proxyt [Ivoclar Vivadent]) (Figure 3), was developed with the goal of being one of the more gentle and minimally abrasive prophy pastes on the market today for the prophylaxis of patients with direct/indirect composite resin restorations. This material, as compared to others, has been shown to be kinder to composites and to glazed porcelain surfaces as well. The only minor challenge, although one could argue it makes this product more "green", is that this it does not come in premeasured disposable mini-cups for dispensing; it is available only in bulk dispensing tubes (like toothpaste). Hopefully, the manufacturer will consider making this product available in the North American markets in more convenient and hygienic disposable uni-dose mini cups at some point in the near future.

Closing Comments

When it comes to "routine" prophy procedures, care should be taken to carefully evaluate your patients' *individual needs* that are based on their specific clinical presentations. Each patient will present with a unique dental history and dental conditions, and if the history includes restorative work, possibly with several varying restoration types, each possibly requiring different treatment approaches. Our work in the dental office should be considered as anything but "routine". Be sure that you and your team are following proper prophy/polishing protocols, and *only when indicated*.

In the author's opinion, further studies are warranted to evaluate the long-term (in vivo) effects of a variety of the most popularly used prophy pastes on the latest glazed and polished all-ceramic materials.

References

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