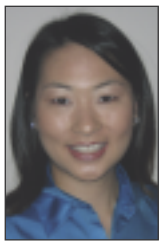
One-Visit Biomimetic Composite Resin Inlays/Onlays

Lorin Berland, DDS



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INTRODUCTION

More and more people are demanding reliable, functional, and aesthetic alternatives to conventional crown and bridge dentistry. As the population is aging, people are seeking out treatment to improve their teeth and still conserve their natural, healthy tooth structure.[1] According to Dr. Ross Nash, "Laboratory-processed composite resin may be a viable option for the patient who desires an aesthetic alternative to gold. While ceramics can provide many of the same benefits, composite resin has some advantages, including ease of adjustment and repair, resilience for comfort and shock absorption, less chance for differential wear at the luting agent-restoration interface, and no wear of opposing structures in functional contact."[2]

Unfortunately, 2-appointment procedures for crowns are inconvenient, uncomfortable, and expensive. Furthermore, more preparation may be required for additional mechanical retention of temporary restorations, defeating the purpose of trying to save the most tooth structure. So, what are our options—direct resins, indirect resins, and porcelain crowns? Crowns, we all know, will require the removal of even more tooth structure, 2 appointments, and provisional crowns.

Let's think like our patients. Our patients want to replace old, ugly, and failing restorations, but they want to do it consistently, efficiently, and predictably—and they would prefer to do it in one appointment. Direct fillings can be done in one appointment, but when wide, deep, and/or interproximal surfaces are involved, they can prove difficult, time-consuming, and inadequate.

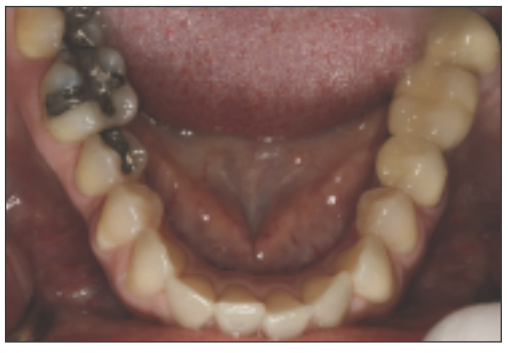

Figure 1. Preoperative photo showing an existing 3-unit bridge on the mandibular left and amalgams on the right.

Figure 2. Fender Wedge (Directa) placed to protect adjacent tooth during amalgam removal. Split rubber dam technique used with multiple teeth.

Adhesive dentistry offers a more conservative restorative approach to patient care. Why take away healthy tooth structure? Why not attempt to save the good and just replace the bad? A laboratory-fabricated composite resin system is a valuable and worthwhile option to preserve both tooth structure and long-term dental health. After all, preserving natural tooth structure is always in the best interest of the patient, whenever possible. This article will demonstrate a conservative and biomimetic approach to restorative care.

CASE REPORT

Diagnosis and Treatment Planning

Our patient presented with large Class II amalgam fillings on her lower right quadrant and a 3-unit bridge on her lower left quadrant (Figure 1). She told us that she wanted to avoid having crowns, root canal treatments, extractions, and bridgework on her lower right teeth. Previously she had spent a lot of money for invasive treatments done over multiple appointments in having her lower left teeth treated. This time, she was determined to find an alternative that would prevent her from having to relive that experience when she had her lower right teeth restored.

After thorough clinical and radiographic examinations, we presented her with a new treatment option which she had not heard of previously: biomimetic same-day resin inlays/onlays. When she learned the benefits of these same day inlay/onlay restorations, she was on board immediately. Who would not want to save time, save money, and avoid potential pain?

Figure 3. Filling undercuts on the model.

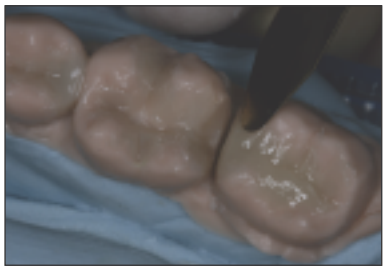

Figure 5. Adding the incisal shade.

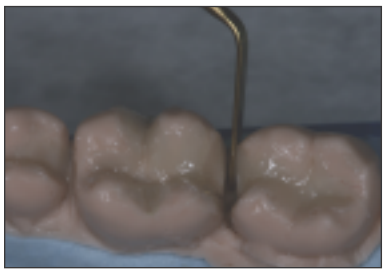

Figure 4. Layering the dentin shade.

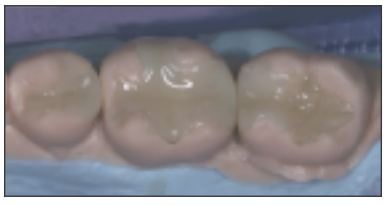

Figure 6. Polished onlays on the model.

Treatment and Techniques

We began by placing the nitrous oxide mask. By wearing the mask, the patient is protected from inhaling any potential mercury aerosols during amalgam removal. Local anesthesia was administered and placed. The rubber dam acts as another barrier to protect the patient from ingestion/aspiration of any amalgam particles during removal. In addition, the rubber dam keeps the area isolated, dry, and clean. The split dam technique was employed because multiple teeth were being prepared in the quadrant.

A Fender Wedge (Directa) was then placed between teeth Nos. 29 and 30 to prewedge for tighter interproximal contacts later, and to prevent possible knicking of the adjacent tooth structure (Figure 2). Once the amalgam was removed, Caries Detector (Kuraray) was applied to ensure complete decay removal from the teeth. The internal surfaces of the preparations were microetched. Disinfectant (HemaSeal & Cide [Advantage Dental Products]) and a seventh-generation adhesive (OptiBond All-In-One Unidose [Kerr]) were applied according to the manufacturer's instructions. Flowable composite (Matrixx [Discus Dental]) was used to fill in the undercuts from the previ-

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ous amalgam preps. The preparations were then refined and impressions were taken with Identic Syringable and alginate (Dux Dental).[3] The syringable material was placed around the preparations while an assistant loaded the quadrant tray with alginate. Placing the alginate over the syringable cools the material, while the tray acts as a carrier. We took 2 impressions, as there were 3 interproximal surfaces affected.

In-Office Laboratory Techniques

The impressions were taken into our in-office lab and disinfected. They were then immediately poured with Mach (Parkell) vinyl polysiloxane material. The base was poured-up using the bite registration and placed on a disposable articulator as an index. Next, any slight undercuts were filled with wax (Classic Opaque Sculpting Wax [Renfert] and the UltraWaxer [Kerr]) on the model (Figure 3). The first layer of indirect composite (Premise universal composite [Kerr]) in a dentin shade was placed and cured (Figure 4). Once the tooth was built up incrementally with dentin, an incisal or enamel shade was layered to create a more lifelike appearance (Figure 5). These restorations were placed in the Belle Glass curing unit (under light, pressure, and heat) for the recommended time limit. Once the onlays were cured, they were microetched, steam cleaned (Steaman Jr. [Bar Instruments]), and placed back on the models to check for fit. The margins were trimmed with various burs and then the restorations were polished using a bristle brush with polishing paste and a chamois wheel for a final high shine (Figure 6).

Figure 7. Onlay try-in. Voids will be filled in with a resin cement.

Figure 8. Etch and prime restorations using a split rubber dam and Fender Wedges.

Figure 9. Immediate post-op photo: the cemented onlays.

Figure 10. Immediate post-op photo: an occlusal view showing the one-appointment onlays on the mandibular right and the previously placed bridge on the left.

Try-In and Delivery

The onlays were then tried in the patient's mouth to ensure that the fit was good. Any voids around the margins will be filled in during the cementation process (Figure 7). Once the fit was verified in the mouth, the split rubber dam and Fender Wedges were placed, while an assistant etched and primed the onlays prior to seating (Figure 8). Next, the teeth were etched, and a fifth generation bonding agent (OptiBond Solo Plus [Kerr]) was placed. Flowable (Premise universal composite) was used to bond the onlays. Excess cement was removed and the occlusion was adjusted accordingly (Figure 9).

The patient loved the way her teeth looked and felt, but she appreciated our conservative approach more than anything. She even brought up the difference between her 3-unit bridge on the left side—the process she went through to have that done versus the partial coverage onlays on her right side—and how she wished she had done this for both sides (Figure 10).

CONCLUSION

A laboratory-processed composite restoration is recommended whenev-

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In/Onlay Reimbursement

Tom M. Limoli, Jr

An inlay is an indirect restoration constructed of cast metal, porcelain/ceramic, or composite/resin that neither supports nor replaces a cusp (or cusps) of a tooth. The inlay restoration is nothing more than a centric stop in that it provides no protection for the cusp tip as concerns lateral and/or protrusive masticatory forces in excursions.

The onlay component of an inlay/onlay restoration is another story. The onlay component replaces the cusp tip (or tips). The onlay entirely replaces the cusp tip so as to maintain and/or restore the vertical dimension in the preparation. When the cusp tips are sound (Figures 3, 6, and 8), the original vertical dimension is not altered.

The coding sequence provides for a single code number to identify an inlay with an associated onlay component. As we all know, it is a technical impossibility to construct an onlay without first identifying the surfaces of the inlay. Hence, the descriptions are currently somewhat misleading.

With regard to third-party reimbursement, few if any benefit plans consider an inlay in the absence of an onlay component to be a contractual benefit. Since an inlay is nothing more than a centric stop that adds little or no strength to the remaining natural tooth structure, it is traditionally reimbursed at the level of a traditional, direct restoration.

Inlay restorations (Figures 6, 7, and 9) are optional benefits when the tooth can be restored adequately with a similar direct restoration. An allowance is generally made for that similar material, and the patient is responsible for the difference in cost.

Table. 2010 Resin-Based Composite Inlays/Onlays

Code	Description	Lower	Low	Medium	High	Higher	National Average	National RV
	Inlay/Onlay Restorations							
D2650	Inlay—resin-based composite composite/resin—1 surface	$205	$448	$450	$801	$1,155	**$574.00**	**13.05**
D2651	Inlay—resin-based composite composite/resin—2 surfaces	$250	$493	$495	$846	$1,200	**$619.00**	**14.07**
D2652	Inlay—resin-based composite composite/resin—3 or more surfaces	$350	$593	$595	$946	$1,300	**$719.00**	**16.34**
D2663	Onlay—resin-based composite composite/resin—3 surfaces	$500	$743	$745	$1,096	$1,450	**$869.00**	**19.75**
D2664	Onlay—resin-based composite —4 or more surfaces	$554	$783	$795	$1,169	$1,475	**$968.70**	**22.02**

 This data represents 100% of the 90th percentile. The relative value is based upon the national average and not the individual columns of broad-based data. The abbreviated code numbers and descriptors are not intended to be a comprehensive listing. Customized fee schedule analysis for your individual office is available for a charge from Limoli and Associates/Atlanta Dental Consultants at (800) 344-2633 or visit Web site limoli.com.

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er a highly aesthetic one-visit restoration is desired. These fully-cured and durable restorations exhibit desirable characteristics, including: excellent marginal integrity, minimal porosity, minimal polymerization shrinkage, fully-cured, very durable, high tensile strength, high surface hardness, and very smooth surfaces resulting in less plaque accumulation and better gingival health.[4]

Laboratory-fabricated indirect composite resin restorations provide an incredible solution that will preserve, not diminish, natural tooth structure for our patients. Patients in your practice will recognize the value of these services and will appreciate your efforts—*what an excellent practice builder!*✦

References

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Dr. Berland is a Fellow of the American Academy of Cosmetic Dentistry, the co-creator of the Lorin Library Smile Style Guide, and the developer of the Web site denturewearers.com. He also is the founder of Berland Dental Arts, a multidoctor specialty practice celebrating 25 years in the Dallas Arts District that pioneered the concept of spa dentistry. He currently serves as the editor of the *Cosmetic Dental Tribune*. Dr. Berland is also the creator of "Biomimetic Same Day Inlay/Onlays," and "The Latest and Greatest in Cosmetic Dentistry—A Full Mouth Rehab in 2 Visits," both awarded 8 Academy of General Dentistry credits. His unique approach to dentistry has been featured on television and publications such as *20/20, Time, Town & Country, Reader's Digest, GQ, US News & World Report, Woman's World, Details, Dallas Morning News, Good Morning Texas,* and *D* magazine. In 2008, The American Academy of Cosmetic Dentistry honored Dr. Berland with the 2008 Outstanding Contributions to the Art and Science of Cosmetic Dentistry Award. He can be reached via email at the address drberland@dallasdentalspa.com.

Dr. Kong began her career working with a master ceramist in one of the world's finest dental laboratories. She graduated from Baylor College of Dentistry, where she has served on faculty. She can be reached via e-mail at drkong@dallasdentalspa.com.

Disclosure: The authors report no conflicts of interest.

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