the name of the game in dentistry to-day is to save the tooth for use in the future. In this age of adhesive dentistry, respecting and preserving the remaining healthy tooth structure as well as improving esthetics have become components of value as well. With today’s advanced technology and materials, longevity is mainly a matter of diagnosis, correct treatment planning and proper execution of technique. The problem with replacing old amalgams with tooth-colored composites is that they are difficult, inconsistent and unpredictable. Yet, the warranty on these 30-, 40- and 50-year-old silver fillings is running out. We have to remember that amalgam technology is more than 150 years old. At that time, people lost their teeth a lot earlier and died a lot earlier.

Now, however, we have a population that is over 50 years old and growing – and they want to keep their teeth feeling good and looking good. Patients are now living longer and they want and expect to keep their teeth for a lifetime.

Adhesive dentistry offers a more conservative restorative approach to conventional dentistry. Why take away healthy tooth structure when there’s a viable alternative? Why not attempt to save the good and just replace the bad? Direct composites and laboratory composite resin systems are valuable and workable, while options to preserve tooth structure and long-term dental health. After all, preserving a patient’s natural tooth, whenever possible, is always in his or her best interest.

It has been our experience that providing multiple, large interproximal posterior composites directly can be difficult to achieve on a consistent basis in the oral environment, especially when replacing amalgams. Why? Because they take a lot of chair time. Amalgams require bulk. That’s why we taught the block type preparation to provide the necessary bulk for strength.

Furthermore, because amalgams do not bond, we taught to create undercuts and “extension for prevention.” As mercury contracts and expands with cold and hot temperature changes over time, cracks form in the glass-like nature of teeth.

Most of the time, these large props are difficult to restore with direct composite. There are isolation and contamination issues, and it is difficult to replicate nature in the mouth in a timely, cost-effective and predictable manner for every case, every time. In addition, curing in layers makes for a long appointment and increases the possibility of contamination. It is uncomfortable for patients to keep their mouths open for the prolonged amount of time necessary.

Often, large direct posterior composite resins yield unsatisfactory results in terms of esthetics, and especially long-term function, due to curing and contamination issues.

However, when we do same day inlay/onlays out of the mouth and in the laboratory, we find that multiple posterior restorations are easier, stronger and more anatomical- ly correct. Because they are processed at the same time, they can be even more time efficient than using a CAD/CAM system and reduce tooth movement during the transition- al phase that can result in altered contact or occlusion.

Not having to deal with provisional restorations absolutely eliminates those untimely emergencies when temporaries break or come off. Those costly, non-productive, uncomfortable and unhappy second appointments can also be avoided, saving everyone time and money. In addition, without concerns about retention of temporaries, preparation can be even more conservative.

Case No.1

In this case, the patient came to our office on an emergency basis with a broken tooth on the upper right molar. It was no surprise that the tooth had a previously placed MO amalgam with recurrent decay that caused the mesio-buccal cusp to fracture off completely (Figs. 1, 2). Often, teeth that have had old amalgam fillings tend to break due to cracks caused by the expansion and contraction of the metal alloy in the tooth’s glasslike substance.

In addition, caries detectors were non-exis- tential when the bulk of amalgam restorations were placed so many teeth have recurrent de- cay under the old amalgam fillings. After thorough clinical and radiographic ex- aminations were performed, it was deter- mined with the patient’s input that a same- day onlay would be the most prudent option for this tooth. This way, he would be receiv- ing the maximum amount of care in the least amount of time.

The procedure

After placing topical anesthetic, articaine HCl 4 percent with 1,000,000 epinephrine was ad- ministered to achieve profound anesthesia. Next, a nitrous oxide oxide mask was placed to decrease the patient’s exposure to mercu- ry aerosol while the amalgam was being re- moved. In this case, because the patient opted not to use nitrous oxide, pure oxygen was ad- ministered through the nasal mask.

We continued by isolating tooth #3 with a rubber dam. This step was essential to reduce the amount of amalgam ingested by the pa- tient. It also offers isolation, higher visibil- ity and better dentistry for our patients. If doing quadrant dentistry, I like to use the split-dam technique, which stretches to include several adjacent teeth in a quadrant. A FenderWedge (Directa) was then placed to separate and protect the adjacent tooth during prep, air abrasion, etching, bonding and refining while continuing to wedge the teeth for a tighter in- proximal contact in the final restoration.

To remove the remaining of the old amalgam restoration, a hourglass-shaped dia- mond bur was used as diamonds are less like- ly to produce the fracture and craze lines as- sociated with carbide burs. High-speed evac- uation was used throughout the procedure to help decrease possible inhalation and inges- tion during amalgam removal.

Caries detector was painted onto the pre- pared surface, and it was noted that cracks associated with the long-time expansion and contraction of the mercury-filled amalgam restoration had contributed to the appar- ent interproximal decay. Once the decay was carefully and completely evacuated using a small, round diamond bur and a spoon exca- vator, the tooth was insulated in a few impor- tant steps (Fig. 3).

First, disinfectant was placed on the prepared dentinal surface (Hemaseal & Cide, Advan- tage Dental Products) and air-thinned. Then, two coats of self-etching bonding agent (Opti- Bond All-In-One Unidose, Kerr Dental) were placed to provide reduced postoperative sensi- tivity and high dentin bond strength.

After air thinning and light curing, a flow- able composite (Premise Indirect Facial Dentin, Kerr Dental) in the lightest shade was added to the in- ternal walls and floor to create an even floor and to fill in undercuts that were originally prepared for amalgam retention. A flat-end cylinder, fine-grit, short Shank diamond was used to refine the tooth preparation after in- sulation was completed (Fig. 4).

Next, two Identico hydrocolloid alginate im- pressions (Dux Dental) were taken fast and accurately. They take only 90 seconds to set with our chosen materials, so they are ideal for same-day inlay/onlays. Before expressing the hydrocolloid material into the prepped tooth, we squirted a little surfactant (PrepWet Plus, Dux Dental) onto the tooth to wet the prep while my assistant mixed the alginate.

Meanwhile, a second assistant was loading a syringe with warm Identico Syringeable Hydro- colloid (Dux Dental) onto the tooth to wet the prep. The “plug” was initially squinted away from the prep and then into the prep itself so as not to interfere with a “clean” impression. Once the tray had been loaded with the alginate (Identico, Dux Dental), the first assistant hand- ed it to me. The tray was inserted with gentle pressure and held steady for 90 seconds. An- other impression was taken using the same aforementioned steps.

The patient then had about an hour break while the inlay was being made and was able to make the most efficient use of his time by having his teeth cleaned with the hygienist during this break in treatment. This not only made the time seem to pass faster for the pa- tient, but it also eliminated “dead time” in our schedule.

The patient made the most of his time in the chair, with his broken tooth and getting his teeth cleaned. This type of combination treat- ment lends itself to a more productive day when planning incise this way, and patients really appreciate it.

Lab work

Meanwhile, back in the lab, the impres- sions were fine-lined and then poured with MACH-SLO (Parkell) and based with bite registration material on a C- lite articulator (Parkell) (Fig. 5). An electric waxing unit was used to block out any undercuts on the die (Ultra Water, Kerr Lab).

The onlay was incrementally built in com- posite layers with a D2 primary dentin base shade (Premise Indirect Primary Dentin, Kerr Dental) followed by an A2 facial dentin shade (Premise Indirect Facial Dentin) and a neutral incisal shade (Premise Indirect Incisal, Kerr Dental).

Once the onlay was cured with light, heat and pressure in the hot-air oven (Dux Dental) for 10 minutes, it was fitted, adjust- ed and polished on the silicone models (Figs. 6, 7) with various burs and polishing wheels. All margins, contours and occlusion were meticu- lously and accurately verified outside the mouth, saving valuable chair time and clinical frus- tration.

Seating the onlay

When seating the onlay, a medium size Iso- lite (Isolite Systems) was applied for easy iso- lation, suction and speed during the seating of the onlay. No further anesthesia needed to be administered as the tooth had been lined with flowable composi- tes during the prep stage. Patients really ap- preciate this — especially because they are al- most back to “normal” by the time they leave.

The onlay was then tried to verify proper contacts, contours and margins. Before cementation, Exaspal (Kerr Dental) was

Same-day inlay/onlays strive to save the tooth

mCME articles in Dental Tribune have been approved by HAAD as having educational content for CME credit hours. This article has been approved for 2 CME credit hours.
gently packed into the sulcus (Fig. 8). The alu-
mion chloride dried the tissue, reducing the risk of sulcal seepage and contamination. The FenderWedges were then inserted beneath the interproximal floor to slightly separate and isolate the adjacent teeth and to help fa-
ciliate seating the onlay.

After rinsing the Exopayl (Kerr Dental) thor-
roughly, the enamel and composite core were gently micro-etched with aluminum oxide (EtchMaster, Groman Dental) to increase re-
tention and remove any debris. Then the enamel and composite core were etched for 15–30 seconds. A single component, fifth-
generation adhesive (OptiBond Solo Plus Unidose, Kerr Dental) was applied in two coats and air-thinned until there was no more movement. The enamel should be glossy (Fig. 9). Flowable composite (Premise Flowable, Kerr Dental) was dispensed into the prepped tooth and then the inlay was inserted into the tooth.

The FenderWedges were removed and the on-
lay was further seated using the Titanium-coat-
ed #20 Acorn with gentle pressure. Complete
seating was facilitated using the contra-angle
packer/condenser while an explorer was help-
ful in removing excess flowable before cur-
ing. When dealing with onlays involving in-
terproximal surfaces, it is a good idea to floss
after seating the onlay and before curing. The restoration was cured from all angles, start-
ing at the interproximal gingival floors where
leakage is most likely to occur.

Occlusal flash and excess flowablecomposite were
removed using an Ultra Water, Kerr (Lab), paying special attention to avoid the margins (Fig. 19).

Starting with the Premise Indirect (Kerr Den-
tal) dentinal shades (A2 primary dentin and
A1 facial dentin) and ending with incisal
dentinal shades (A2 primary dentin and
A1 facial dentin) dentinal shades (A2 primary dentin and
A1 facial dentin) dentinal shades (A2 primary dentin and
A1 facial dentin), the onlay was incre-
mentally fabricated in layers using various composite
dog components. The onlay was then placed in the BellaGlass oven for heat,
pressure and light curing.

In approximately 10 minutes, the onlay was ready
to be finished with multiple finishing burs (Fig. 20) on the silicone models. The on-
lay was polished for a high shine and then
checked on the model to verify accurate inter-
proximal contacts and margins (Fig. 21).

Seating the onlay
When seating the onlay, the Isolite was re-
plied for isolation, ease of placement and
the patient’s comfort during the cemen-
tation stage. Before cementation, Exopayl
(Kerr Dental) was gently packed into the sul-
cus, creating a dry space between the tooth
and tissue without any risk of rupturing the ephemeral attachment (Fig. 22). The Ex-
opal (Kerr Dental) was rinsed off thorough-
l and the FenderMate was adapted to the ad-
ijacent interproximal surface with a condens-
er (Fig. 24).

Once all of this was properly placed, the enamel and composite core were first micro-
etch to remove any debris and increase me-
chanical retention of the surface of the com-
posite flowable liner. Then the surface was
further prepared for bonding with 37 percent
phosphoric acid for 15–20 seconds.

A single-component, fifth-generation adhe-
sive (OptiBond Solo Plus Unidose, Kerr Den-
tal) was applied in two coats and air-thinned
until there was no more movement. Curing
was done at this time. Flowable composite
(Premise Flowable, Kerr Dental) in the
lightest shade was then dispensed into the
prepped tooth before inserting the onlay into the tooth.

Before curing, the FenderMate was removed
and the onlay was further seated using a con-
denser with gentle pressure. Complete seat-
ing was facilitated using the contra-angle
patter/condenser. An explorer was helpful in
removing excess flowable before curing.

Flows were applied between the involved in-
terproximal surfaces before curing and left in
place to remove excess interproximal cement
and facilitate the cement removal step after
seating.

The restoration was cured from all angles,
starting at the interproximal gingival floors
where leakage is most likely to occur. Oc-
cussal flash and excess flowable composite
was “buffed” with a short flame carbide
while the interproximal margins were adjust-
ing was done on another tooth to make the

to be conservative.

Regarding durability, esthetic inlays and onlays
are not new anymore. They have a record of ac-
complishment, and it is good. Wherever you practice, and how you practice, these res-

tes have an aesthetic, economical and

very much appreciated!

Case No. 2
This patient also came in with a den-

tal emergency. The filling had fallen out of his

over the involved tooth, protect the adjacent in-

terproximal surface and pre-wedge the teeth

the first tooth was anesthetized. Next, a

(Fig. 12).

The tooth was microetched, etched and
desensitized with HemaSeal and Cide (Ad-

Advantage Dental Products). Two layers of self-

cy-threading agent (OptiBond Solo Plus Unidose, Kerr Dental) were applied to pro-

provide reduced postoperative sensitivity and

was long enough to maintain it.

Flowable composite (Premise Flowable, Kerr Den-
tal) was added to the internal walls and floor,

creating an even floor and filling in un-
dentified areas. Composites were originally prepared for car-

ies removal and amalgam retention (Fig. 15).

After the tooth was insulated, the prep was refi-
ed with a carbide cylinder, fine-grit

sharp shank diamond.

Two identical hydrocolloid impressions (Dux

Dental) were taken as before. These im-

pressions were hand poured in the lab (Fig. 16). During the time between the onlay prep and seat, a small fill-
ing was done on another tooth to make the most of this appointment time slot while the onlay was being fabricated in the lab.

Lab work
As described in Case No. 1, the assistant im-
nediately poured the impressions in the lab
with MACH-SLO (Parkell) after dissectioning
them and basing them with a rigid, fast-set-
ting bite registration material such as Blu-
mousse (Parkell) (Fig. 17). Within two min-
utes, we had a working silicone model on
which to build the onlay (Fig. 18). The under-
cuts were then blocked out with an electric
water (Ultra Water, Kerr Lab), paying special
attention to avoid the margins (Fig. 19).

When seating the onlay, the Isolite was re-
plied for isolation, ease of placement and
the patient’s comfort during the cemen-
tation stage. Before cementation, Exopayl
(Kerr Dental) was gently packed into the sul-
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denser with gentle pressure. Complete seat-
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Contact Information
Dr. Lorin Berland, a fellow of the AADC,
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