Crown or same-day onlays – A clinical example

The advantages of indirect composite resin restorations

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“The trend in dentistry today is clearly toward more aesthetic and less invasive. Indirect resin and ceramic inlays and onlays are no longer only compatible with this trend, but fulfill very nicely the restorative void between fillings and crowns.”

Dr Ronald D. Jackson (Cosmetic Dental Tribune, December 2008).

In terms of durability, aesthetic inlays and onlays are no longer new. They have a track record—a good one. With today’s materials, longevity is mainly a matter of planning and proper execution of technique. The problem with replacing old amalgams with tooth-coloured composites lies in its difficulty. In addition, they tend to be inconsistent and unpredictable.

But the warranty on these 50-, 40-, 50-year-old silver fillings is frequently prove to be inadequate, especially over time. The inherent problems of isolation; the large bulk of composite required, the layered curing of the composite and the effects of shrinkage all affect contacts, occlusion, margins and post-operative tooth sensitivity. Gold will always be an excellent restoration material for posterior teeth, but because of its appearance, mass and increasing price, it is becoming increasingly undesirable in today’s image-conscious society.

The preparation

The patient in this clinical case came in with a dental emergency. The filling had fallen out of his broken, lower right molar the day before he was going overseas for three weeks on business. He wanted a quick and permanent solution (Fig. 1). The tooth was anesthetised. Next, a FenderWedge (Directa Dental) was used to further isolate the tooth involved, protect the adjacent interproximal surface and pre-wedge the teeth for optimal contacts (Fig. 2). The Isolite (Isolite Dental) was used to further isolate and desensitise with HemaSeal and Cale (Advantage Dental Products, Inc.). Two layers of a self-etching bonding agent (OptiBond All-In-One Universal, Kerr Dental) were applied to provide reduced post-operative sensitivity and high dentine bond strength. This was then air-thinned and light-cured. Flowable composite (Premise Flowable, Kerr Dental) was added to the internal walls and floor, creating an even floor and filling in undercuts that were originally prepared for caries removal and amalgam retention (Fig. 4). After the tooth had been insulated, the preparation was refined with a flat-end cylinder, fine-grit, short-shank diamond. Two Identite hydrocolloid impressions (DUX Dental) were taken to make the onlay in the laboratory (Fig. 5).

After disinfecting the impressions, the assistant immediately poured moulds using MACH-SLO (Parkell, Inc.) and based them using a rigid, fast-setting bite registration material (e.g. Blu-Mousse, Parkell, Inc.; Fig. 6). Within two minutes, we had a silicone working model on which to build the onlay (Fig. 7). Undercuts were blocked out with a waxer, carefully avoiding the margins (Fig. 8). Starting with the Premise Indirect (Kerr Dental) dentinal shades and ending with incisal shades, the onlay was incrementally finished and polished (Fig. 10). Running out. We have to remember that amalgam technology is over 150 years old. At that time, people lost their teeth much earlier and died a lot earlier, too. Nowadays, however, we have a large and growing segment of the population that is over 50 years old—and they want to keep their teeth functioning well and looking good. Let’s think the same way our patients do. They want to replace these old amalgams, but they want to do it conservatively, consistently, efficiently, predictably and economically. They also want us to do it in one visit. So, what are the advantages of indirect, laboratory-processed, composite resin, posterior restorations?

Restorations fabricated in this manner look better, undergo less shrinkage, help restore the strength of the tooth, have minimal porosity and excellent marginal integrity. They are also very durable and have smoother surfaces that are kinder to the gums and result in less plaque accumulation. Patients appreciate avoiding the inconvenient, uncomfortable and expensive second appointment because no second appointment means no temporaries, no emergency visits, and best of all, the preservation of healthy tooth structure.

By contrast, replacing amalgam restorations with direct posterior composites, especially ones involving an interproximal surface, are difficult for the patient as well as the dentist. For many reasons, these direct composite replacements frequently prove to be inadequate, especially over time. The inherent problems of isolation, the large bulk of composite required, the layered curing of the composite and the effects of shrinkage all affect contacts, occlusion, margins and post-operative tooth sensitivity. Gold will always be an excellent restoration material for posterior teeth, but because of its appearance, mass and increasing price, it is becoming increasingly undesirable in today’s image-conscious society.

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mentally fabricated in layers and then placed in the Premise curing oven (Kerr Dental). In approximately 10 minutes, it was ready to be finished with various finishing burs (Fig. 9). It was polished to a high shine and then checked on the model to verify accurate interproximal contacts and margins (Fig. 10).

**Seating the onlay**

When seating the onlay, the isolated was re-applied for isolation, ease of placement and patient comfort during cementation of the onlay. Prior to cementation, Exxayl (Kerr Dental) was gently packed into the sulcus, creating a dry space between the tooth and tissue without any risk of rupturing the epithelial attachment (Fig. 11). The aluminium chloride dries the tissue, reducing the risk of sulcal seepage and contamination. The FenderMate (Directa Dental) was then inserted beneath the interproximal floor to slightly separate and isolate the adjacent teeth and to help facilitate seating the onlay (Fig. 12). The remaining Exxayl paste was rinsed off thoroughly and the FenderMate was adapted to the adjacent interproximal surface with a condenser (Fig. 15). The enamel and composite core were then etched for 15 to 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. Flowable composite (Premise Flowable) was dispensed into the prepared tooth prior to inserting the onlay into the tooth. The FenderMate was removed and the onlay was further seated using a condenser with gentle pressure. Complete seating was facilitated using the contra-angle packer/condenser (Fig. 14). An explorer is helpful in removing excess flowable before curing.

The restoration was cured from all angles, starting at the interproximal gingival floor where leakage is most likely to occur. Occlusal flush and excess flowable composite was buffed with a short flame carbide, while the interproximal margins were adjusted with bullet or needle carbides. A Bard-Parker #12 scalpel was used to remove interproximal cement. Once the proper occlusion had been established, a diamond-impregnated point and cup were used to polish the restoration (Fig. 15).

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