

Replacing large failing posterior restorations

Accreditation Case Type 4

(A posterior quadrant showing two or more direct or indirect restorations)

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Introduction

The dental media often promote cosmetic dentistry to be typified by placement of multiple porcelain veneers. The reality for most dentists and clients is very different. One of the most common requests is for the replacement of existing amalgam restorations. Another reality is that many dentists are not adequately trained in, or wary of the placement of, tooth coloured alternatives. The materials and techniques now exist to allow a tooth coloured restoration to not only be a viable alternative but to be the most predictable and aesthetic long term clinical solution. The patient in this case was a 42-year-old female in good health who attended for a cosmetic consultation. She was unhappy with the appearance of her large amalgam restorations.

Diagnosis and treatment plan

Comprehensive clinical examination of all hard and soft tissues revealed generally good oral health. The existing restorations 35, 36 and 37

were all showing signs of marginal failure. Routine hygiene was required to achieve perfect dental health. A TMJ and occlusal examination was also undertaken. BioPak vibration analysis confirmed a healthy TMJ and her Class 1 occlusion with canine guidance, no interferences and little wear made her a good candidate for predictable placement of indirect posterior restorations.

A full series of photographs were taken and the images discussed with the patient. It was discussed that the use of porcelain inlays would be the most predictable solution.

Treatment process

Preparation

Local anaesthesia was administered as an inferior dental nerve block (IDB). A triple tray was loaded with Aquasil and a pre-op impression was taken to help make the provisionals. The existing restorations were removed and the cavities refined for the inlay and onlay preparations.

Expasyl was syringed into the interdental regions of the gingival sulcus, left for three minutes and then rinsed off to provide temporary gingival retraction. Impressions were taken with Aquasil low viscosity syringed directly onto the preparations with Aquasil rigid loaded into a stock tray. A stump shade was also recorded and photographed.

Temporisation

The teeth were spot etched and Optibond FL 2 resin was applied, air thinned and cured. In the deeper regions and interdentally Systemp Inlay temporary material was packed and then cured, this facilitates the removal of the final bis-acrylic layer. Luxatemp A1 was used to make the temporary restorations. This is syringed into the pre-op silicone and the patient instructed to bite back into the triple tray. The Luxatemp is left to set fully on the teeth and then trimmed once the silicone is removed. The occlusion on the temporaries was evaluated and minor adjustment made. Instructions are given to the patient, especially with regard to oral hygiene in the interdental regions.



Figure 1: a-b – Before (left) and after (right) images of the case

Figure 2: a-b – Before (left) and after (right) images of the case



Cementation

Local anaesthesia was administered as an IDB and the temporary restorations were removed. The preparation was cleaned with Cavity Cleaner and checked very carefully for resin tags and interdental resin. The restorations were then tried in; firstly dry to allow the fit to be checked and then loaded with water to allow better evaluation of the shade. The restorations were etched with phosphoric acid (to help clean and re-acidulate the fit surface), dried, silanated, coated with Optibond FL resin, loaded with Variolink II A1 base and placed in a resin keeper.

The teeth were isolated, etched with 35% phosphoric acid for 15 seconds and rinsed. The tooth was lightly dried with high volume suction to avoid dessication. Optibond FL primer was applied as several coatings before using suction and gentle air to evaporate off solvent. One coat of Optibond FL 2 resin was applied and lightly air thinned.

The restorations were then placed on the teeth and the gross excess removed with a brush. Pressure was applied to the restorations on the occlusal aspect before tacking at the occlusal margin for 2 seconds using a 2mm light guide. The interdental areas were cleared of excess using floss, saws and perforated strips. Once clean, glycerin gel was placed

(to prevent oxygen inhibition layer formation) and the restoration was cured for 40 seconds on all surfaces using a 13mm tip.

The gel was then rinsed off. Any remaining excess was then trimmed with fine carbide burs. Interproximal regions were checked with floss and any ledges removed with Brassler serrated and visionflex metal strips.

The occlusion was checked using AccuFilm and adjusted as required, adjusted regions were polished with Dialite cups and points followed by Enamelise paste.

Conclusion

The very accurate fit of this type of restoration makes porcelain inlays and onlays highly predictable and aesthetic long term solutions for the replacement of existing fillings or caries.

Armamentarium

- EOS 20D Digital camera (Canon, Tokyo, Japan)
- Vitapan 3D master shade guide (Vita, Bad Sackingen, Germany)
- AccuFilm II (Parkell, Farmingdale, NY)
- Aquasil LV (Regular set) and Rigid (Regular set) (Dentsply/Caulk, Milford, DE)
- Optibond FL (sds/Kerr)

- L.E. Demetron II (Demetron Research Corporation, Danbury, CT)
- Luxatemp A1 (DMG/Zenith, Englewood NJ)
- Ultra-Etch 35% (Ultradent)
- Expasyl (Expasyl, Kerr Dental Products, Romulus, Michigan)
- Artex articulator and facebow (Girrbach, Germany)
- Consepsis chlorhexidine rinse (Ultradent)
- Variolink II A1 (Ivoclar/Vivadent)
- Systemp Inlay (Ivoclar/Vivadent)
- Brush #3 (Cosmedent)
- Visionflex Diamond Strips (Brasseler)
- Glide floss (Gore, Flagstaff, AZ)
- Serrated Steel Saw Blades (Brasseler)
- Dialite Porcelain polishing kit (Brasseler)
- Enamelise composite polishing (Cosmedent, Chicago, IL)

Further reading

- Christensen G. Restoration or crown? *J Am Dent Assoc.* 1997 128: 771-772.
- Donly K, Jensen M, Tricolo P et al. A clinical comparison of resin composite inlay and onlay posterior restorations and cast gold at 7 years. *Quint Int.* 1999 30: 163-168.
- Jackson RD. Aesthetic inlays and onlays; A clinical technique update. *Pract Periodont Aesthet Dent.* 1993 5: 18-27.