



# Direct Composite Resin Veneer Restorations Using an Intraoral Direct Mock-Up

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## Treatment list

- Routine hygiene visit
- Dual arch tooth whitening
- Direct bonded composite veneers

## Restorative material

- Ecosite Elements (DMG)

## Introduction

This woman presented to us having viewed our work on Facebook. She had erosive wear and attrition in her adult anterior maxillary dentition, spacing and some other concerns in her posterior dentition including retained roots. This woman is 66 years old. She requested minimally invasive options in order to lighten her anterior teeth in order to improve her smile and repair the wear that had occurred over the years. She showed no interest in restoration of the remaining dentition and she told us she was going to get her regular general dentist to maintain her remaining dentition and remove retained roots.

## History

The attrition of her anterior teeth was historical and age appropriate, whereas the erosive wear was from a highly acidic diet in her 50s which she had now addressed and ceased. I felt that direct composite resin veneers (Terry DA. (2004)) in combination with tooth whitening could possibly give an aesthetically pleasing result.

A direct freehand composite intraoral mock-up was carried out (Fig. 1) in order to show her the result I felt we could achieve. This showed her the repaired morphology and also closed diastema between UL12. This also allowed me to fabricate an incisal edge lap silicone stent which would be used to guide the definitive restorations.

A highly polishable high quality multi-layer composite resin was required with exceptional handling.

I therefore chose Ecosite Elements (DMG) for the definitive restorations. The pre-operative colour/shade of the patient's teeth was assessed in natural light to be primarily A4/D3 Vita.

## Treatment plan summary

1. Full examination, medical, dental and social history recorded, along with patient expectations of treatment. Direct composite mock-up agreed with colour analysis (Marus R (2006)). Incisal edge lap silicone stent fabricated from acceptable mock-up. Limitations explained and patient consent and financial agreement reached.

2. Three hygiene visits to ensure periodontal health.

3. Tooth whitening at home with custom trays and 10% carbamide peroxide (Fig. 2).

4. Shade taking to be completed two weeks after tooth whitening (Wilson, D. (2009)). Vita shade B1 was selected. Ecosite Elements shade wheel was initially used to give a guide as to enamel and dentine shades required to achieve a Vita B1 result. Then custom shade tabs were fabricated in surgery using Ecosite Elements composite in both B1 dentine and EL enamel to confirm the final aesthetic result shades (Fig. 3).

5. Minimal preparation and sand blasting of UL12 UR12 then placement of bonded direct composite resin veneers utilising stent fabricated from mock-up. Enamel/dentine composite shades B1/EL and slight INC translucent highlights in mamelon grooves and incisal edge (Dietschi, D. (2008)).



Fig. 1: Pre- and post-diagnostic mock-up.



Fig. 2: Pre- and post-tooth whitening.



Fig. 3: Dentine B1 and enamel EL shade checks.

6. Refinement of primary and secondary morphology and final finishing and polishing of composite resin with addition tertiary morphology.

7. Review one week later.

#### Operative procedure and completion of treatment

Treatment visits:

1. Three hygiene visits and impressions taken for custom upper and lower whitening trays.

2./3. Fit of whitening trays and completion of whitening.

4. Placement of direct composite veneers UR12 UL12.

Shade taking was completed using custom shade tabs and small pieces of composite placed on teeth to confirm enamel and dentine shades (Figure 3).

Articaine 4% (1:100,000 epinephrine) local infiltration given, PTFE tape on adjacent teeth and 00 Ultrapak (OPTIDENT) retraction cord on each tooth individually. Incisal edge silicone stent made from mock-up utilised as palatal matrix for palatal and incisal enamel shade initial build-ups. UR1 UL1 teeth initially completed in order to dictate correct centre line and incisal level. The central incisors are the pillars of the smile on which we can build the final result (Devoto et al. (2010)).

The surfaces of the teeth were abraded with a coarse polishing disc and stains removed with bevelling of enamel at a 45-degree angle (Fig. 4). The area to be bonded was sand-blasted (Prepstart-DANVILLE). A total etch technique (37% phosphoric acid by SDI) was undertaken, followed by rinsing and partial drying, and Adhese Universal bonding agent (IVOCLAR) applied, dried and cured. Utilising the silicone stent Ecosite Elements Layer shade EL was placed to give incisal/palatal enamel shell layer and form proximal lobes (Fig. 5). Ecosite Elements Pure shade B1 was used to form dentine body and mamelons (Fahl N Jr (2006)); this provides a more opaque dentine layer as we would find in nature (Fig. 6). The dentine shade was brought onto existing enamel to hide transition in junction at neck of tooth and to give a higher chroma in this area. Ecosite Elements Highlight shade INC was placed into incisal area and partially into mamelon grooves. Final facial enamel layer was then placed with EL and cured in one increment (Dietschi, D. (2001)). Ti Fine composite instruments (COSMEDENT) were used for manipulation of composite under 4.3x magnification (Zeiss eyemag pro S). These composite layers were placed freehand without the use of a matrix, in order to provide the correct proximal lobe morphology and emergence profile. Palatal surface was shaped and finished with Jet Carbide egg and bullet jet finishing burs (Kerr). The same process was completed on remaining anterior teeth using the same stent with the appropriate changes in number of mamelons and morphology to correspond to tooth being restored – only two mamelons on the enamel of UL2 UR2 (Fig. 7).

Photographs were taken in order to study colour and primary and secondary tooth morphology between treatment visit and refinement visit.

5. Follow up and refinement/finishing/polishing to all four veneers was now carried out. It was decided on review of photos that some minor adjustments to contour were required in order to improve smile design.

Secondary morphology was then developed in order to achieve correct line angles utilising flexible soflex discs and long tapered diamond burs (G850-314-012-10ML, G856-314-018-8-F), guided with the use of pencil drawn on the teeth. Each tooth was contoured in order to mimic its contralateral corresponding mirror image. Tertiary morphology was then created with coarse diamonds at 5000 rpm (G850-314-012-10ML) and a long thin flame diamond (G889-314-0009-3.5-F) and polishing was begun using blue and pink polishing flexi cups and points (COSMEDENT), with final lustre created using Optishine brushes (Kerr), goat hair brushes and felt discs (Micerium enamel plus composite finishing kit) and aluminium oxide paste (Shiny C Optident) (Peyton JH (2004)). Margins at gingival level and interstitially were refined using No. 12 scalpel blades and polishing fine flamed diamonds. Polishing strips Flexidiamond and Flexistrips (COSMEDENT) were used interstitially with COMPOSHINE plus shapeguard polishers RA (COLTENE) run at 4000 rpm. Photographs were taken.

Review one week later to refine/polish margins, check aesthetics and take photographs.



Fig. 4: Preparation of tooth surface with sand blast abrasion and a check with silicone stent of mock-up.



Fig. 5: EL enamel placed with lobes.



Fig. 6: B1 three dentine lobes placed.



Fig. 7: Two dentine lobes with mesial lobe being smaller than distal.

## Reflection

Our patient during the consent procedure was very clear on her desire for the most minimal but effective approach to treatment and the refusal for me to address posterior dental issues. Due to acceptance of the look of the free hand mock-up I felt a reasonable success could be achieved. The lack of symmetry in the anterior segment and also the diastema UL12 brought some significant challenges in achieving symmetry in the smile. Good solid recorded valid consent was taken for our patient. Obviously, we need to offer the best technical product we can, mindful of every technical advantage we can find for our patients to achieve their restorative and aesthetic goals. Ecosite Elements is a nano-hybrid composite which provides us with a long-lasting polish whilst conveying strength and wear resistance to our restorations.

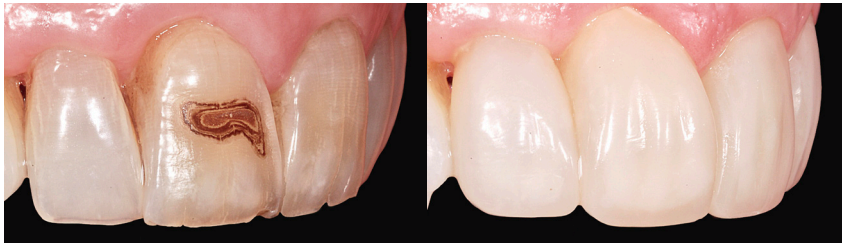
In this case the patient said she would be happy with a result similar to that of the mock-up, the change in appearance was immediately accepted by the patient without question and without request for adjustments (this rarely happens!). This serves to emphasise the importance of managing patient expectations utilising a mock-up.

Before and after clinical photos



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