

Aesthetically and anatomically indistinguishable restoration

Here we look at how Dr Nadeem Younis achieved a natural looking restoration of a lateral incisor



Figure 1: UR2 poor aesthetics



Figure 2: Black and white photo showing low value compared to teeth on either side

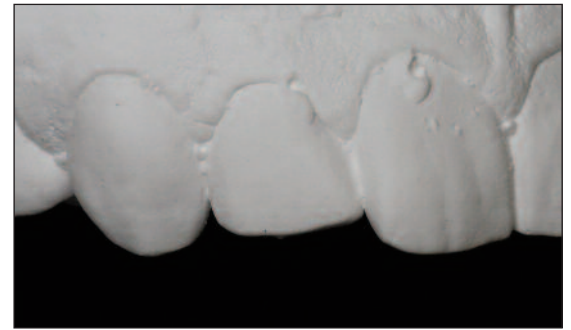


Figure 3: Pre-op study model

A patient consulted Bridge Dental Practice in Burnley because she was unhappy with the appearance of her maxillary right lateral incisor, which had been restored with composite resin (Figures 1 and 2). On examination, it was found that the restoration was monochromatic and had become discoloured. It had poor anatomical form, with an inappropriate tooth width/length ratio, and was not in line

with the arch.

Dr Nadeem Younis recalls: 'The patient requested that the tooth be restored in correct alignment with the arch and so that the colour matched the adjacent teeth. The treatment plan was to restore the upper right lateral incisor with Venus Diamond to provide a natural-looking restoration. The shade would be matched to the teeth on

either side as well as building the tooth labially, so that the lateral incisor was in line with the arch.'

Recreation of polychromatic characteristics

Composite resins provide a conservative means of aesthetic restorations in the anterior dentition. With the advancement of materials in recent years, it has become possible to create a restoration that cannot be practically distinguished from the tooth structure. This can be achieved if the composite system offers opaque dentine shades with a wide range of chroma. The enamel shades need to be of varying translucency which, when combined with the underlying dentine shades, provide a restoration that is indistinguishable from the natural tooth in terms of hue, value and chroma. Dr Younis chose Venus Diamond for this case because, 'from a clinical point of view, the material does not stick to instruments, so there is no "pullback" and no instrument wetting agents are required during composite placement. The variety of dentine shades allows the clinician to recreate the polychromatic characteristics of a natural tooth. The translucent enamel shades allow the characteristics in the underlying dentine to shine through.'

Nadeem continues: 'The polishability of the Venus composite restorations is good, and a mirror shine can be achieved with minimal effort. The shade guide is made up of the composite material and uses the vita system. This makes the selection of shade for the tooth to be restored much easier than with a system where the dentine and enamel need to be mixed and matched.'

Planning 3D build-up

A treatment wax-up of the lateral incisor was undertaken (Figures 3 and 4). Upon approval by the patient, a silicone index (Figure 5) was obtained from the waxed up model to aid the build-up of the tooth in three dimensions. This facilitated determination of the incisal edge position and the palatal anatomy.



Figure 4: Treatment wax-up of UR2 to full contour giving a pleasing width-to-length ratio

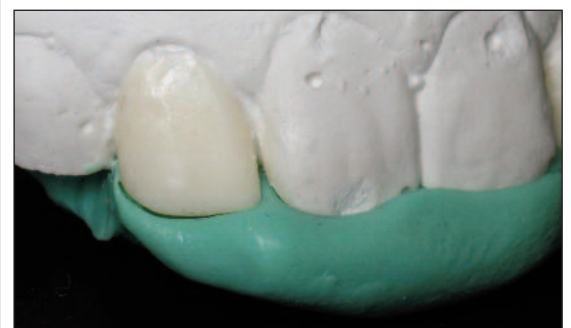


Figure 5: Fabrication of silicone index



Figure 6: Following composite removal



Figure 7: Checking the silicone index for fit



Figure 8: Protection of adjacent teeth

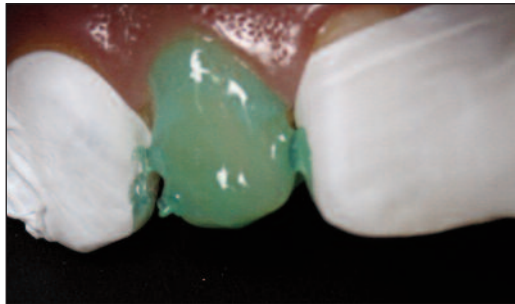


Figure 9: Etchant applied



Figure 10: Application of bonding agent



Figure 11: Palatal enamel placed in the silicone index



Figure 12: Silicone index with composite in situ light cured



Figure 13: Approximal surfaces built up in clear enamel



Figure 14: Enamel shade A2 applied cervical 13



Figure 15: Enamel shade A1 applied middle and incisal 13

Nadeem describes how 'the shade was selected at the beginning of the treatment, by placing composite on the moist tooth surfaces for the enamel shades'. The enamel shades chosen were A2 for the cervical third of the tooth and A1 for the middle and the incisal thirds, as well as a blue tint to recreate the halo effect at the incisal edge. A translucent enamel shade (CL) was chosen to overlay the build-up without blocking out the shade characteristics created in the underlying restoration. The defective composite restoration was removed revealing a diminutive lateral incisor (Figure 6). The silicone index was tried in for fit and the space available for the polychromatic build-up was analysed (Figure 7). The silicone index aids accurate recreation of the incisal edge and the palatal surface. This avoids time-consuming adjustments on the palatal surfaces for premature contacts and occlusal interferences.

A more manageable situation

The adjacent teeth were protected prior to etching, washing, drying and application of the bonding agent as per manufacturer's instructions (Figures 8, 9, 10). Clear enamel (CL) was placed in the silicone index and then transferred to the teeth where it was light cured in situ (Figures 11 and 12). This defines the palatal and the incisal boundary within which the composite is to be placed incrementally.

The approximal walls were built up with the aid of cellular matrix strips, this defines the mesial and distal extent of the restoration (Figure 13). The inter-proximal walls were built just labial to the contact areas. This allows sufficient space for the final enamel layer to be placed labially, once the dentine layers have been incrementally added. Dr Younis explains: 'Building up the palatal and the approximal surfaces in this manner



Figure 16: Approximal wall reduction to simulate the contralateral incisor

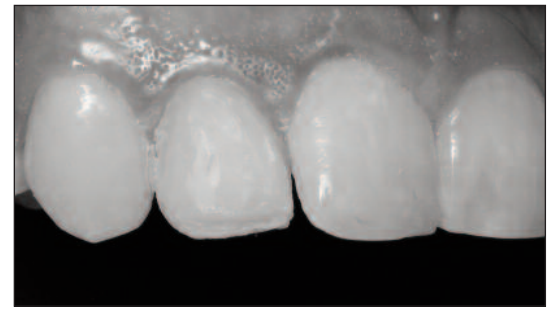


Figure 17: Black and white photograph to ascertain the correct value



Figure 18: Application of blue incisal effect



Figure 19: Overlaying the dentine effect colour with clear enamel



Figure 20: Initiating finishing procedures



Figure 21: Immediate post op following polishing



Figure 22: Black and white photo showing correct value post op



Figure 23: One week post op

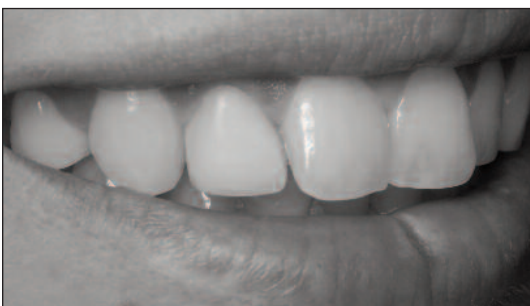


Figure 24: One week post op

converts a difficult situation into a more manageable one, with only small palatal adjustments required postoperatively'. The cervical third and the main body of the tooth are built up with enamel shades A2 and A1 respectively (Figures 14 and 15). The mesial approximal wall was adjusted to match the contralateral incisor. The value was checked with a black and white photograph (Figures 16, 17) before the application of the incisal tint to recreate the incisal halo effect (Figure 18) which was light cured. A final 0.5mm increment of clear enamel (CL) was placed on the middle and the incisal thirds of the dentine build-up. Nadeem adds: 'The translucent enamel allows the underlying characteristics in the restoration to shine through' (Figure 19).

Dimensional finishing sequence

Finishing procedures were initiated by marking the mesial

and distal transitional line angles and the extent of the incisal edge (Figure 20). Adjustments were carried out with fine diamond burs in sequence, beginning with the mesial and distal proximal contacts, followed by the buccolingual plane and the mesial and distal transitional line angles. The labial surface between the transitional line angles was flat and the tooth surface 'dropped' interdentally into the embrasures beyond the transitional line angles. Finally, the incisal edge was adjusted to reproduce the macro-morphology of the tooth surface. Polishing was done with Eptax tape interdentally and Soflex discs labially.

Good integration and aesthetically pleasing smile

According to Nadeem Younis: 'The postoperative result showed an aesthetically pleasing lateral incisor, with a favourable width/length ratio. The colour and the value were similar to the adjacent teeth (Figures 21 and 22)'. One week later, the follow-up review showed good integration of colour with the adjacent teeth and an aesthetically pleasing smile in the anterior region (Figures 23 and 24).



Dr Nadeem Younis has a special interest in aesthetic and orthodontic dentistry. He runs hands-on composite courses for general dental practitioners and accepts case referrals. Dr Younis is a full member of the British Academy of Aesthetic Dentistry and is a partner in Bridge Dental Practice, Burnley, in Lancashire. Nadeem qualified at Sheffield in 1993.