

A clinical case involving severe erosion of the maxillary anterior teeth restored with direct composite resin restorations

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The management of individual cases presents each clinician with a variety of attractive options and sophisticated evidence-based solutions. Financial constraints can often restrict these options and limit the choice pathways that can be offered. The case presented here demonstrates the management of severe erosion on the maxillary anterior teeth via a minimally invasive, practical, and economic route.

When tooth surface loss occurs,¹ it can be clinically challenging to isolate a single etiological factor since it is usually multifactorial in origin. The patient presented with the classic signs of erosion (Fig 1a). A major causative factor of this erosion was a large consumption of carbonated beverages on a daily basis over a number of years. Chronic exposure of dental hard tissues to acidic substrates led to extensive enamel and dentin loss from both intrinsic and extrinsic sources (Fig 1b and c). The ACE classification guides the clinician on the management options of treatment modalities, which are dependent on the severity of the erosion.²

The patient provided some photographs of his smile from over 20 years before (Fig 2). The treatment plan goal was to restore the lost tooth volume from the maxillary right to left first premolars, and restore three of the mandibular premolars with additive direct composite resin. The molars were not included in the rehabilitation since the existing gold restorations were well fitting. By providing positive occlusal stops at the new VDO only up to the second premolars, one could rely on the intrusion of the premolars or on the overeruption of the molars, or on a combination of these. Both mandibular canines were planned to have additive direct composite risers placed, and the cervical lesions on the mandibular left posterior teeth were to be restored with direct composite resin restorations.

Composite resin restorations allow for a conservative approach.^{3,4} The merits of modern composite resin materials include esthetics, strength in thicker section, good stress absorption, and reparability. They also provide for a stable medium- to long-term fixed solution



Fig 1 (a) The patient's initial appearance. There is significant loss of tooth substrate noticeable from this portrait view. (b) The condition of the teeth clearly demonstrates the damage and loss of tooth structure due to erosion. (c) The palatal view shows the complete loss of enamel and the near exposure of the pulp of all anterior teeth. The enamel border presence is a classical presentation of extensive erosion.

that can be used for accurate reference when and if it becomes financially viable for the patient to consider ceramic restorations in the future, strategically postponing more invasive prosthodontics to fully utilize and extend the capacity of the natural teeth.

The author's experience has shown that the initial markers of a diagnostic mock-up should be carried out intraoral-

ly to establish the desired central incisal position and, if there is to be an increase in the occlusal vertical dimension, then also to build up the palatal aspect with good stops using restorative material with good bulk. The bulk serves to provide strength and replace the lost volume while reducing incidence of chipping and fracturing. This allows for good direct visualization and can be modified

as necessary prior to taking primary diagnostic photographs for the laboratory technologists to start from.

In this case, the intraoral mock-up served as a template to create a silicone index into which the composite resin restorations could be built (Fig 3a and b). This avoided additional costs for the patient, and reduced the timescale involved (the treatment was an urgent priority for the patient, who had become extremely conscious of his smile). The composite resin mock-up of tooth 21 was left *in situ* for tooth 11 to be built up, again under rubber dam. This served to provide more control of the midline and maintain better control of form. This is helpful when placing extensive challenging freehand composites. The composite resin on tooth 11 could be provisionally finished to obtain the final outline form; the same could then be carried out on tooth 21. Once tooth 21 was restored, a direct composite resin mock-up of teeth 12, 13, 22, and 23 was fabricated, and a new silicone putty index

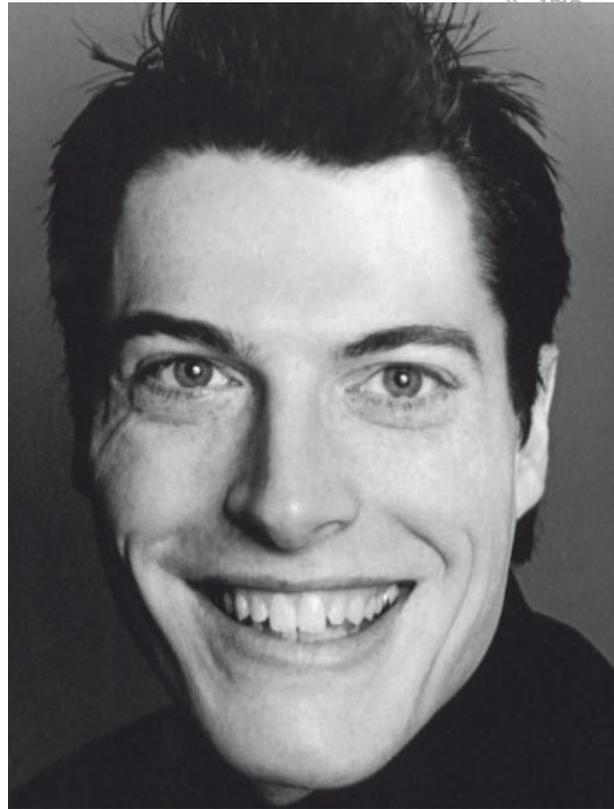


Fig 2 The patient provided some photographs of his smile from over 20 years before. The central incisors were considerably longer than the lateral incisors. The patient's desire was to try to recreate this situation.



Fig 3 (a) Direct mock-up in composite resin of the central incisors. This was done to give an idea of how much length could be provided in relation to the lip and smile line. It also enabled the assessment of the form in relation to the photographs provided. **(b)** The palatal view of the direct composite mock-up, which shows the extent of the addition of material that was possible.



Fig 4 A silicone putty index was made from the mock-up. Then, split rubber dam could be applied and the composite resin mock-up of the maxillary right central incisor removed, while leaving the mock-up of the left central incisor *in situ*. This allowed for good control of the midline position and contact areas. This restoration would be completed with basic polishing. Then, the same was repeated for the maxillary left central incisor, after which a new direct mock-up was performed for the maxillary lateral incisors and canines. Each tooth was restored individually.

was made, into which each restoration could be built. Each tooth was restored individually under rubber dam (Fig 4).

The patient was then seen a week later for additive composites on teeth 14, 24, 34, 43, 44, and 45. The occlusion was checked. The patient had adapted very well in this short time to the changes. The full initial treatment plan could not be completed because the patient did not return to restore tooth 33 and the buccal cervical lesions. He wanted to avoid a protective nightguard, which was originally prescribed in the treatment plan.

Composite resin does not have the same long-term esthetic performance as ceramics. Therefore, it must be stressed from the outset that refurbishment will be required in the future to maintain these restorations.⁵ All the photographs shown here were taken with the teeth dried, and prior to any polishing or refurbishing procedures (Figs 5 to 10). They clearly show the changes of the composite resin surface that occurred over time. It must also be noted that the material



Fig 5 (a) At 1 year. This photograph was taken with the teeth dried and without polishing or refurbishment having been carried out. Note the reduction of the luster over this time, and also the lack of depth of the restorations due to the loss of luster. **(b)** Occlusal view at 1 year.



Fig 6 Photograph of the patient's smile at 5 years.



Fig 7 Close up of the maxillary teeth at 5 years, being the postoperative view taken in a dry field. Once again, note the lack of luster, areas of filler plucking, and increased opacity of the restorations.



Fig 8 Maxillary occlusal view at 5 years. Physiological wear over time can be noted by the areas of wear facets and indentations on the aging composites. Note the bulk of material and thickness of the incisal edges. Thicker incisal edges in composite resin significantly reduce the incidence of chipping. The existing gold restorations did not require replacement.



Fig 9 Mandibular occlusal view at 5 years. The patient still has not had cervical restorations or the canine riser addition on the mandibular left side restored. The existing gold restorations are still functioning.

changes in optical appearance over time, and micro surface anatomy tends to wear down and soften. The loss of surface polish reduces the translucency of the restorations, and hence the depth of characterization cannot be noticed without a polished surface. Saliva, however, does provide an excellent illusion of composite luster. Composite resin will wear at a favorable rate compared to enamel and dentin, and it exhibits physiological wear and adaptation to the dynamic situation in the oral environment, which will undergo changes over time.

When the patient is ready to do so at a later date, a refurbishment will be required, as well as the completion of the rest of the original plan. Furthermore, this working model can be copied in the future when ceramic restorations or hybrid-type sandwich restorations are eventually selected.⁶⁻⁸



Fig 10 Final portrait view at 5 years.

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