

FEATURES SECTION

How to ... debond Clarity brackets with ease

R. T. Lee

Queen Mary, University of London, London, UK

Debonding ceramic brackets has been difficult due to problems with enamel fractures, enamel tears and patient discomfort. New brackets have weaker bases and the debonding technique has changed, with a recommendation that a pair of Mathieu needle holding pliers is used with Clarity brackets.

Key words: Debonding, ceramic brackets

Introduction

Ceramic brackets bonded to enamel have a high bond strength. As a result of this, manufacturers have adjusted the design of the brackets—first, by introducing mechanical locking of the bases, rather than chemical retention, and more recently by introducing weaknesses in the construction of the base of the brackets. In a clinical evaluation by Artun¹, the removal of Transcend ceramic brackets was associated with 20% of teeth having enamel cracks when the bonding of the base was by chemical retention, with a rate of 10% of teeth having enamel cracks where a mechanical bond of the base existed. In addition, 9% of all brackets required removing by grinding the bracket fragments with an air-rotor. Using a similar bracket system and different bonding material and debonding technique, Lee², reported it was only necessary to remove fragments in two of 373 brackets by grinding.

A new collapsible ceramic bracket was introduced by Unitek 3M, the Clarity Bracket, and Bishara *et al.*³ reported that the debonding characteristics of this bracket were similar to metal brackets in laboratory testing. The removal of the bracket was associated with a high Adhesive Remnant Index, with the majority of the composite resin being left on the tooth on removal of the bracket and, therefore, enamel cracks were most unlikely to occur.

In a more recent laboratory study by Theodorakopoulou *et al.*⁴ both the Clarity Bracket and the Inspire Bracket had mean bond strengths that were considered higher than those which would be clinically optimal. The removal of the brackets, however, resulted in bracket failure at the bracket adhesive interface, and there was

no evidence of enamel fracture or cracking with the Clarity Bracket. In their study, all the Clarity Brackets were debonded completely in the testing procedure without any fracture of the bracket base.

Manufacturer's technique

The manufacturers recommend the use of a pair of Weingart pliers applied to the end of the metal slot on the mesial and distal, with pressure applied lightly, so the bracket will fail at the vertical groove. In clinical practice, this generally occurs, but frequently bracket remnants are left on the teeth and, occasionally, bracket fragments are not held by the pliers. In addition, the procedure can be noisy and uncomfortable for the patient.

Proposed technique

It is preferable to use a pair of Mathieu needle holding pliers, which are flexible pliers with a retention clip designed for holding a needle without excessive force or distortion of the needle. It is not possible to apply heavy force with these pliers, as the force is limited by the spring clip, which locks the arms of the pliers. The width of the beak allows a wide surface contact of the pliers with the bracket base, and the springiness of the pliers' arms and the retention clip ensure that excessive force is not applied. The retention clip retains the bracket and little discomfort is felt by the patient. It is suggested that the beaks of the pliers are applied to the mesial and distal of the bracket bases, rather than the end of the metal slot. This will result in less bracket fragmentation. The mechanism is shown in Figure 1. The bracket is



Figure 1 The beaks of Mathieu needle holding pliers are applied to the mesial and distal of the bracket base

gently clasped on the mesial and distal of the base, and in many cases will lift off before the clip of the pliers is engaged. Once the clip is engaged, a very gentle mesial-distal rocking force may be applied to produce the bracket collapse, and the debonded bracket will be retained by the pliers with the bracket being lifted off without any discomfort to the patient (Figure 2).

Clinical experience

The success of the debonding procedure was recorded on 10 consecutive patients with 80 bonded brackets. Seventy-three of the brackets debonded completely with no retained fragments, while seven brackets had small fragments left on the teeth. The removal of the fragments is undertaken by the use of a tungsten carbide bur in a slow air motor hand piece (Figure 3). The composite is removed on the mesial and distal side of the bracket base fragment without any attempt to remove the base. This allows the application of bracket removing pliers on the mesial and distal of the fragment (Figure 4).

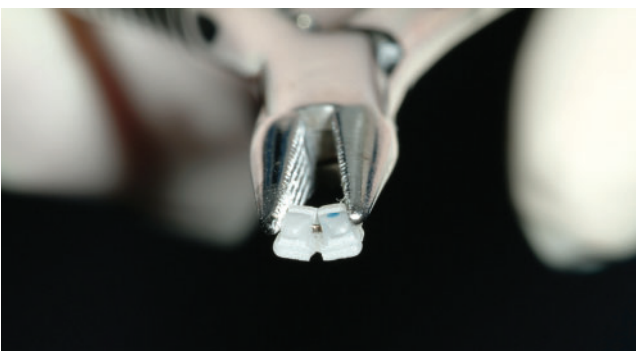


Figure 2 The bracket is retained by the pliers with a fracture occurring in the bracket base



Figure 3 Composite on the mesial and distal of the bracket fragment is removed with a tungsten carbide bur

The removal of the residual base fragment is likely to have been eased by the previous removal of the main part of the bracket, but nevertheless, for patient comfort and safety the patient should have safety glasses in place, and occasionally the removal of the bracket is accompanied with a cracking noise. Light forces should be sufficient, however, to remove the bracket and it is unlikely an enamel fracture will occur. It should not be necessary to apply an air-rotor for grinding of the bracket base, as there is a potential for enamel damage with this procedure as reported in a scanning electron microscopy study, Staribratova-Reister *et al.*⁵

Conclusions

Removal of Clarity Ceramic Brackets is easily achieved without discomfort to the patient by the application of light forces using Mathieu needle holders on the mesial and distal of the bracket base. In the majority of cases, the bracket will be lifted off without fragmentation and,



Figure 4 Debonding pliers are applied to the mesial and distal bracket base fragment

in a small number of cases, the residual fragments can be removed with a pair of debonding pliers after removal of residual composite on the edges of the bracket base.

References

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