TECHNIQUE CLINIC

Scoring of Ceramic Bracket Bases for Easier Debonding

Although aluminum oxide ceramic brackets are about nine times as hard as stainless steel or enamel,[1] their resistance to fracture is 20-40 times *lower* than that of stainless steel, making them extremely brittle.[2,3] A high bond strength resulting from the composition of the ceramic bracket base (whether chemical adhesion, mechanical adhesion, or a combination of the two[2-5]), along with the inability to "peel" the bracket from the tooth,[6] further increases the potential for enamel damage in debonding.[1-5,7-9]

3M Unitek's Clarity* ceramic bracket features a vertical slit designed to concentrate stress in the bracket body and thus create a fracture line for debonding with a Weingart or How plier. Debonding studies comparing Clarity and metal brackets have shown similarly acceptable enamel conditions and adhesive remnant index scores.[2,5]

We have developed the following simple, safe, and economical technique to create a stress concentrator in any brand of ceramic bracket by scoring it with a diamond bur.[9,10]

Procedure

After removing the archwire (A), create a fracture line by abrading the bracket body along its long axis between the two tie wings. Use a long, tapered, high-speed diamond bur under water cooling to prevent damage to the pulp (B). Cut down almost down to the adhesive layer, but avoid cutting too far, given the diameter of the bur. Additional abrasion mesial and distal to the center line of the base can further reduce the force needed to fracture the bracket in debonding (C).

Once the fracture line has been created, use either a Weingart or a How plier to squeeze and fracture the tie wings (D). How pliers tend to produce better results than Weingart pliers because of the greater distance between the plier hinge and tips, which makes for a better fit between the internal surfaces of the tips and the external surfaces of the tie wings.

In most cases, the two halves of the bracket will debond simultaneously. If one half stays on the tooth, it is easily removed by applying a rocking motion with the same plier.

Ceramic fragments often remain on the enamel after debonding of monocrystalline brackets[1] (E), requiring removal with the same high-speed diamond bur under water cooling. Any adhesive remnants should be removed by using a low-speed, six- or 12-blade tungsten carbide bur with a smooth, rounded tip. In this case, water cooling will make it difficult to differentiate between the tooth surface and the adhesive; the adhesive should be kept

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dry so that its matte finish will contrast with the luster of the emerging enamel.

Use a rubber cup at low speed with fluoride-containing prophylaxis paste to polish the enamel as usual (F).

Conclusion

This has proven to be a straightforward, easy, and quick debonding method that preserves the integrity of dental enamel. It is particularly useful in the removal of monocrystalline ceramic brackets, considering their greater brittleness compared to polycrystalline brackets.[1] Our patients no longer complain of discomfort, as they did when ceramic brackets were debonded with lightwire or How pliers before we began scoring the bracket bases.[11]

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