

# Practice Points

## Bond Failure Analysis

**A**t one time or another, all orthodontic practices will experience the dislodgement of brackets. To minimize lengthy appointments and stress to the team, patients and parents, a quick bond failure analysis should be conducted so repeat bond failures do not occur. When dealing with a bracket base, a bonding material, a bonding surface, a clinician, and a patient, localizing the problem will require some objective reasoning.

First of all, choose a bracket system that has a nicely contoured base that fits the tooth and has a good mesh backing that “hugs” the clinical crown. Failure to have a perfect fit will allow for leakage between the bracket base and the tooth, resulting in a bond failure. When replacing a bracket, always start with a new one. Used brackets frequently have distorted bases and the time required to remove adhesive from the base is not cost effective.

Most bonding agents available today have superior bond strength. In my experience, the self-cured agents seem to have a stronger bond over the light-cured. When using a light-cured product, consider the curing light strength (they do wear out) and of course the curing technique. Be sure the initial cure is from the lingual surface for labially placed brackets and buccal for lingual brackets and bonded retainers. This ensures the materials’ initial cure will be “toward” the tooth. Light-cured products are also more viscous in nature and tend to slide before you get the light to it. An improperly positioned bracket will not hug the tooth and may result in a bond failure. If using a self-cured material, be sure to follow proper isolation techniques and allow for the recommended setting time.

The bonding surface is frequently responsible for brackets coming off. Hypocalcified, fluorosed, or decalcified enamel is very difficult to etch. If this is the case, try a “no-etch” product. Anatomical considerations such as microdontia, excess or deficient heights of contours or severe attrition make it difficult to place brackets correctly, resulting in an ill fit. Failure to have a perfect fit will allow for leakage between the bracket base and the tooth, resulting in a bond failure. When bonding to porcelain, composite or metal, try using an adhesion booster to enhance bond strength. Sometimes the best solution for a bonding surface problem is to have the lab fit a band.

Clinician technique is an important factor to consider. The brackets are designed to fit snugly on the clinical crown with little room for error. An improper fit of the base to the tooth, as mentioned above, will result in leakage and a bond failure. Also, an ill-fitting bracket will also affect the

final tooth position, frequently the cause of “case finishing” stress.

Finally, we have a patient. Eating hard foods and chewing on pens are examples of situations that dislodge brackets that are beyond the control of the dentist. The most commonly seen patient-induced bond failure is poor oral hygiene and diet. Plaque accumulation around bracket bases will break down the bond. Carbonated and sugar beverages will do the same. If patients are not compliant with instructions, treatment should be discontinued and a treatment release signed.

Repeated replacement of brackets does add length to treatment plans and upsets patients, parents and dentists. Next time a bracket comes off, ask yourself why. Could it be the tooth, the bracket, the bond, the clinician or the patient? Knowing the source of the problem will allow you to make the changes necessary so the problem is not repeated.



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A logo featuring a stylized yellow star with a white silhouette of a person holding a dental chair. The star has a yellow outline and a white center. Below the star is a yellow horizontal line.

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