Adhesion – The Solution to all Problems?

Dear Reader,

At first glance, it seems that adhesion has made dentistry extremely simple and solved almost all problems with which a restorative dentist is faced. Today, there is no longer any need to prepare precision-shaped cavities with retention. Due to adhesion, we can prepare minimally invasive cavities which require the removal of decayed tissue only. Is this simpler than cutting precisely predetermined cavity shapes as required by Black? I doubt it. If we bond crowns and fixed partial dentures, there is no need for preparing almost parallel walls of the crowns or abutments in order to obtain friction and retention. As long as we have a large surface to which to bond, we will be successful – won't we? Bonded veneers and full ceramic crowns allow us to create perfect esthetic reconstructions to fully satisfy our patients, because they look more natural than any other type of anterior restorations.

As so often, it is not a black-and-white but rather gray situation, seasoned with lots of "ifs and buts." Just a few examples will explain what I mean: Dealing with a minimally invasive preparation, it is often very difficult to see if all the decayed tissue has been removed. Furthermore, are you sure you really wetted all the internal surfaces with the adhesive? Improperly applied adhesives are most probably the reason for postoperative sensitivity. Cementing crowns becomes very difficult if the finishing lines are located subgingivally. Are you sure that the site was really clean and dry when you applied the adhesive system or the adhesive luting material? Luting crowns or fixed partial dentures with adhesive techniques is also difficult, because the removal of excesses is either a messy operation or very, very difficult, because the resins are tooth colored and firmly bonded to teeth and restorations. Can you be certain you did not overlook any of the excess adhesive and luting agent, which would be a disaster for the periodontal situation?

Our aim and hope is to insert restorations which last for a lifetime. However, as longevity reports show, we are not yet able to do so. This means the day will come when we must remove adhesive restorations. My experience has taught me that this is extremely difficult if the sound dental tissue is to be respected. The better the bond and the better the esthetics, the more difficult this task becomes.

Adhesion has opened many new roads to improving the quality of restorative dentistry. Nevertheless, dentistry has not become simpler. On the contrary, it has become more complicated. Once up on a time, every cement (eg, zinc oxiphosphate cement), regardless of its provenience, was to be mixed and applied equally. Today's adhesives are all different, and every product has its own rules of application. Furthermore, some incompatibilities (see Tay et al. page 91) have arisen due to the trend towards faster and simpler application.

Research and development departments of dental manufacturers are not challenged to seek restorative procedures which are faster and simpler, but rather those which are more forgiving and safer for the patient. Wouldn't it be nice to have an adhesive which signals debonding when it occurs? Or wouldn't you appreciate an esthetic restoration which can be made clearly visible the moment you are forced to replace it?

Yes, adhesion has solved many problems, but it has created new ones. There is plenty of room for improvement. The future is very exciting!

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