

COMPOSITES:

ALTERNATIVES THAT HELP OVERCOME 3 CHALLENGES OF COMPOSITE

THREE CHALLENGES WITH DENTAL COMPOSITE

Resin-based dental composite materials have been used routinely in restorative dentistry since 2000s. They were initially introduced in the late 1960s as an alternative restoration material, but it was in the 1990s that significant improvements led to their widespread use. The obvious benefits to using composite resin are esthetics and lack of mercury, and with patients becoming more conscious of their appearance and overall health, it is not surprising that most clinicians have switched to resin as their material of choice when it comes to daily restorations that do not need full coverage. As composite continued to improve, so did its widespread acceptance, and more and more patients were looking to this as a solution for restoring their caries and replace previously placed amalgam fillings. There are, however, some challenges to using dental composite materials and, in those areas, there is one surprising solution that many dentists don't even think about.



SECONDARY DECAY

Dental composite experiences surface roughness over time as a result of loading and wear. In addition, due to marginal breakdown with

polymerization shrinkage as well as exposure to changes in pH and temperature, restorations experience deterioration. This may lead to caries, especially when the surface begins to roughen, creating an increase in dental plaque accumulation. When bacteria colonize at the margin of the restoration, leakage and restoration failure may result from decay formation.



TECHNIQUE SENSITIVITY

One aspect that few clinicians will admit to is technique sensitivity issues. Composite resin relies on a chemical bond to the tooth after polymerization in order to be retained. Saliva contamination following adhesive placement leads to reduced bond strength due to the deposition of salivary glycoprotein, which creates a physical barrier. This reduces the effectiveness of polymerization and, as a result, a weakening of the bond between the resin and dentin.

Rubber dam isolation is key to helping prevent contamination of saliva and moisture during the bonding process, however, this can not always be achieved. If the clinician is unable to properly isolate all areas during composite resin placement or is unaware of contamination, the



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restoration will subsequently result in breakdown and leakage, which all of us have seen at one time or another, showing up as a stained leaking margin.

LEAKAGE PROBABILITY

Contamination with saliva or moisture during the critical time of adhesive and resin placement is one of the most common reasons for composite resin failure. This contamination is more likely in some situations and certain areas in the mouth. Cervical areas are the most obvious example, as they pose a challenge to proper isolation even for the most skilled clinicians. Exposed root surfaces, proximity to gingival tissue, and expected or unexpected sub-gingival decay are also challenging to restore with composite resin due to inability to isolate. There are also several situations that we are unable to use a rubber dam or isolate properly including patient refusal, limited opening, or patient's inability to tolerate its proper placement. In all of these situations, the decision to choose a most suited restorative material becomes challenging. Some clinicians choose to use amalgam. However, with the growing resistance to mercury among us and our patients, this is quickly becoming an undesirable option.



ALTERNATE MATERIAL OPTIONS

Without going into more costly solutions like crowns and onlays, in more exposed areas where a filling would be preferred as a restorative option, clinicians are challenged as

to the material choice. One obvious choice is glass ionomer, but there is still resistance to choosing glass ionomer among many dentists. Part of this contention is said to be around esthetics, limitation to size and classification of the restoration, as well as the glass ionomer handling properties. And this may have been true at one time, but with significant improvements made to glass ionomer by some manufacturers, it is definitely a fast growing material choice, especially in those compromised areas and situations. To learn more about what's new in the development of glass ionomers and their enhancements, check out the next article called:

"Alternative to Dental Composite Resin that is Mercury-Free & BPA-Free".



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