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بالرسالة صفحات لم ترد بالأصل

“The Effect of Auto-polymerizing, Photo-polymerizing and Dual-polymerizing Self-etching Adhesive Systems on Shear Bond Strength and Nano-leakage of Two Direct Resin Composite Core materials: An in-Vitro Study“

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Dental adhesive systems have witnessed a great evolution in their chemical formulation and their action. Contemporary adhesives are principally categorized according to the adopted adhesion strategy either to etch and rinse or self-etch adhesive (SEA) systems.[1] Dental adhesive are marketed in different application forms, they could be applied in three steps, two steps, single step, depending on how the three pillar steps; etching, priming and bonding are applied to the tooth substrate either in a separate step or in simplified combined step. [2] The simplicity of all in one SEA came on the expense of their high water affinity, even after polymerization making them more hydrophilic.

Dentin bonding adhesive system can be light-polymerized, auto-polymerized, or dual-polymerized.[3] Studies have suggested the application of adhesive systems that are capable of reaching complete polymerization by light exposure prior to placement of the restoration.[4] [5] However, sometimes tooth preparation may result in areas that cannot be effectively reached by the light from the light-polymerizing unit. which may impair the bond strength at these incompletely polymerized areas and compromise the longevity of adhesive restorations.[6] Thus, dual-polymerizing or auto-polymerizing adhesive systems are indicated for direct and indirect restorations to ensure proper polymerization of the adhesive resin in such areas.

Core build-up material should provide resistance and retention means to the coronal restoration. It has to possess sufficient strength to resist the oral cavity occlusal forces and become an integral part of the tooth structure to bear loading forces especially if it won't be covered with a coronal restoration.[7] Resin composite core buildup materials have been introduced for restoring teeth with compromised resistance and retention form prior to crown preparation.

A new class of resin composite material was lately introduced in an attempt to simplify the restoration technique, be less technique sensitive systems and save time, yet give a stable and durable performance. Bulk-fil composite concept was innovated in a couple of decades ago claiming that composite can be inserted and cured in a bulk layer that can reach 4 mm. or even 5 mm. this reconcile with low compliance patients. It also shortened chair time in big cavities build ups and core restorations for endodontically treated teeth, moreover it was claimed by the manufactures that bulk-fill composite can reduce polymerization shrinkage stresses and cusp deflection.[8]

Insuring high degree of conversion and proper polymerization of the deepest layer remained the most challenging issue, especially where the curing light is severely attenuated by resin shade and the distance between light curing device and tooth structure.[9,10] Light cured core composite offers advantages of improved storage time and maintained stability, commanded setting time, higher degree of conversion. However, Dual cured core materials allow dentists to build-up composite in single thick layer, because self-curing component may assure proper polymerization. They offer extended time of the pre-gel phase and slow setting of the self-cured component. This have been stated to decrease the polymerization shrinkage and subsequently relieving the shrinkage stresses through partial flow of the polymerizing material in posterior composite restorations. Although this redeeming feature, it had not been sufficiently proved in recent research. [10 11]

With the large variety of bonding systems formula; Raised problems like adhesives permeability and an adverse reaction between adhesive/composite interface have showed up. Such incompatibility between the adhesive and composite could lead eventually to failure and micro-leakage. [12] This has been demonstrated mainly with simplified adhesives that