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EFFECT OF THE FUNCTIONAL LOADING AND THERMAL FLUCTUATIONS ON THE INTERFACIAL RELATIONSHIP OF ADHESIVELY RESTORAED CLASS V CAVITIES

Fadel. Sobhy* and Moataz F. Elgezawi**

ABSTRACT

The purpose of this study was to evaluate the adhesive quality of two polyacid modified composite resin, two composite resins and one resin modified glass-ionomer after functional occlusal loading and thermal fluctuations in class V cavities. 50 cavities were prepared and were classified into 5 main groups with ten specimens each. 5 specimens in each group were used as controls while the rest of specimens were subjected to occlusal functional loading and thermal fluctuations. The interfacial relationship assessment was carried out using the dye penetration method. All the test groups showed excellent sealing initially that was significantly worsened by occlusal loading and thermal cycling tests. The flexibility of the test material may play a role in determining the durability of the tooth restoration interfacial bond.

INTRODUCTION

Adhesion of resin to dentin has been the subject of considerable interest to biomaterial scientists for many years. Adhesion is required to oppose and withstand the contraction forces during polymerization of composite resin and to insure retention and marginal integrity during functioning of the restored teeth [1-3].

The bonded restoration is challenged by stresses, which may exceed the adhesive or cohesive strength. This in part is dependent on the magnitude and nature of the applied forces. However, other factors as the configuration of the restoration, material properties and application technique play a determining role on the resultant effect of the induced stresses[4,5]. If a restoration is adhesively attached to the cavity walls it will be restrained in it's compliance to contraction and thus contraction forces set up by polymerization shrinkage will generate stress in the restored tooth. The more strain and the stiffer the materials the higher the stress. However it is not only polymerization shrinkage that can cause stress in the restored tooth: dimensional changes due to temperature fluctuations and non-uniform deformation of the components during functional loading will also repeatedly stress a restoration[6-8].

This stress concentrates at discontinuities, both internally at an interface of the filler particles and the matrix and externally at the interface between the cavity walls and the restorations. De-

* Ass. Professor Conservative Dentistry Department, Faculty of Dentistry, Ain Shams University.

** Lecturer Operative Dentistry Department, Faculty of Oral and Denntal Medicine, Cairo University.