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Microtensile Bond Strength of Different Adhesive Systems to Coronal versus Root Surface Dentin under Simulated Intrapulpal Pressure

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To my Mother and my Father

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INTRODUCTION

The increasing demand for esthetic restorative treatments and the ubiquity of preventive approaches have led to a renovation in practice of operative dentistry. This transformation has resulted in a more conservative approach in tooth preparation. Bonding techniques allow such conservative tooth preparations through less reliance on macro mechanical retention and less removal of unsupported enamel (**Robenson et al., 2006**).

A number of new adhesive systems have been developed in an attempt to reduce the steps and simplify the clinical bonding procedures **(Haller, 2000)**. In addition, these systems developed to overcome some of the previously reported limitations encountered with the earlier multi-step etch-and-rinse versions of adhesive systems **(Carvalho et al., 2005)**. However, one of the challenges that facing the adhesive systems' manufacturers has been, and still remains, the development of adhesive agents that equally adhere to different tooth substrates.

Dentin poses greater obstacles to adhesive bonding than does enamel, because dentin is regarded as a biologic composite of apatite filler crystallites in a collagen matrix with a fluid-filled tubular structure connecting the pulp to the dentino-enamel junction. Bonding to this heterogeneous and intrinsically wet substrate is more difficult to achieve, therefore the development of the newest adhesive generations were based on the dentin substrate **(Camborgi et al., 2007)**.

As a means to obtain information about the ability of a material to bond successfully, the use of coronal dentin is widely used as adequate substrate of bonding. However, in the clinical situation, bonding is performed on dentin which is located at various sites. The recent developments in preventive dentistry and periodontology significantly