Age and morphological characterization of resin impregnated dentin layer

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By

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DEDICATION

To Allah asking to accept

To my parents who spurred me to knowledge

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INTRODUCTION

Bonding to dentin has become one of the most interesting and challenging topics in restorative dentistry. The high organic content and tubular structure of dentin as well as odontoblastic processes and the outward flow of fluid make dentin bonding difficult to attain (Pashley, 1990). The importance of dentin adhesion in clinical dentistry is clear. Coupled with the emergence of an older population, clearly this will translate into a greater need for the treatment of root surface lesions. (Heymann & other, 1993).

Dentin is a hydrated biological composite structure composed of dentinal tubules, intertubular and peritubular matrices (Mjör, 1972; Tronstad, 1973). Each dentinal tubule is lined by peritubular dentin, which is characterized by a high mineral content. Intertubular dentin is found peripheral to the peritubular dentin separating the tubules, and its matrix contains 90 per cent type I collagen filled with apatite crystals (Butler, 1992; Mjör, 1972). Close to the pulp in newly erupted teeth, the dentin matrices are less mineralized and represent a small fraction of dentin area, whereas the tubules occupy a large area (Garberoglio & others, 1976; Mjör, 1966). The main age-related change in older teeth includes a gradual enlargement of the peritubular dentin and intratubular mineral deposits, which often result in narrowed or completely occluded tubules (Nalbadian & others, 1960; Stanley & others, 1983) .

Hybrid layer formation represents the main bonding mechanism of current dentin adhesives. This hybrid dentin polymer structure is formed by impregnation of monomers into the demineralized intertubular dentin with subsequent polymerization. Resin infiltration into the dentinal