A COMPARATIVE INVESTIGATION OF MICROLEAKAGE OF LIGHT-ACTIVATED GLASS IONOMER RESIN RESTORATIONS

Thesis

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بسم الله الرحمن الرحيم

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صدق الله العظيم

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Wilson and Kent[1] first introduced Glass ionomer cements to the dental profession in 1972. Their favorable adhesive and fluoride releasing properties have lead to their widespread use as restorative, lining and luting materials[2]. Glass ionomer materials are derived from aqueous polymeric acids and a glass component; the glass is usually a fluoroalumino-silicate, although other non-fluoride glasses have been used, *e.g.* aluminosilicates or aluminoborates[3].

The resin-modified glass ionomer materials are hybrid materials of traditional glass ionomer cement with a small addition of light-curing resin, and hence exhibit properties intermediate to the two, with some characteristics superior to the conventional glass ionomer materials. Generally, they have the advantages of both such as adhesion to tooth structure, esthetics, fluoride release and rapid hardening by visible light[1].

The principle advantages of a bonded restoration include provision of retention without sacrifice of sound dental tissues. They also include inhibition of leakage with penetration of bacteria and stains. However, the clinical problems of recurrent

caries, adverse pulp reactions, post restoration hypersensitivity and discoloration could be eliminated. Furthermore, it helps reinforcement of weakened remaining tooth structure[5-8].

Since the time of introduction of glass-ionomer cements to the profession, dentistry has seen the material evolve from the original glass-ionomer cement to the resin-modified formulations with both chemical- and light cure systems. Because of its many desirable properties, this versatile material has dramatically increased the dentist's ability to meet the restorative needs of patients. These desirable properties include fluoride release, antimicrobial activity, a coefficient of thermal expansion similar to that of tooth structure, and a physicochemical bond with tooth structure providing excellent sealing ability[9,10].

Microleakage was defined as the "passage of bacteria, fluids, chemical substances, molecules and ions between the tooth and its restoration"[11]. The establishment and maintenance of a leak-proof tooth restoration margin is a primary requisite in evaluating the reliability of any bonded restoration. Glass ionomer cements have gained wide spread acceptance as dental restorative materials, especially for restoration of cervical lesions.

Therefore this study was designed to evaluate the marginal sealing ability of glass ionomer and resin-modified glass-ionomer, in comparison to bonded composite resin and bonded polyacid-modified resin composite restorations.

REVIEW OF LITERATURE