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A Histopathologic Study on Pulp Response to Glass Ionomer Cements in Human Teeth

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Abstract:

Statement of Problem: Despite the wide range of new dental materials, there is still a need for biomaterials demonstrating high biocompatibility, antimicrobial effects and ideal mechanical properties. Purpose: The aim of this study was to histologically evaluate the pulpal response to a conventional glass ionomer, a resin modified glass ionomer and a calcium hydroxide in human teeth. Materials and Methods: Fifty five deep class V cavities were prepared in premolars of 31 patients and were divided into 3 groups based on application of the following liners: resin modified glass ionomer (Vivaglass Liner), conventional glass ionomer (Chembond Superior) and calcium hydroxide (Dycal). After applying varnish, teeth were filled with amalgam. Each group was further divided into three subgroups according to time intervals of 7, 30 and 60 days. Teeth were then extracted and their crowns were fixed in formalin. Each sample was assessed microscopically for odontoblastic changes, inflammatory cell infiltration, reactionary dentin formation, remaining dentinal thickness and presence of microorganisms. Statistical analysis including Kruskal Wallis and Mann Whitney was carried out for comparison of mean ranks. ($P=0.05$). Results: In the Vivaglass Liner group, pulpal response was significantly higher on day 7 as compared to days 30 and 60 ($P<0.05$). Reactionary dentin production was significantly lower after 7 days than after 60 days for all materials ($P<0.05$). There was no statistically significant difference in pulpal responses among the three groups during the same time intervals ($P>0.05$). There was no correlation between pulpal responses with micro-organisms and remaining dentin thickness ($P>0.05$). Conclusion: According to the results of this study, light-cured glass ionomer as well as the other tested lining materials were determined to be biologically compatible with vital pulps in deep cavities of sound human teeth.

Keywords:

Pulp response ، Inflammatory cell response ، Glass ionomer

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