



## **Effect of CO<sub>2</sub>Laser and Casein Phosphopeptide- Amorphous Calcium Phosphate paste on Morphological and Chemical Changes of Initial Caries-Like Lesion of Permanent Teeth**

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**Abstract:**The irradiation of teeth with laser in combination with remineralizing agent revealed higher caries resistance. This study aims to investigate the effect of laser and CPP-ACP agent in remineralizing initial caries-like lesion using SEM and EDS analysis. Twenty four teeth (upper first premolar) were divided into control and study groups, the study group was subdivided into five groups (pH\_cycling, laser, CPP-ACP, CPP-ACP followed by laser, Laser followed by CPP-ACP), each group included four teeth, one for SEM and three for EDS analysis. Surface temperature change equation was used to determine the maximum power that enhances morphological and chemical changes in the enamel surface without thermal damage. For both calcium and phosphorus the mean atomic percentages were reduced after demineralization (pH\_cycling), then after the application of laser both calcium and phosphorus revealed slight reduction. After application of remineralizing agent (CPP-ACP) both calcium and phosphorus the mean atomic percentages increased and further increase of both calcium and phosphorus the mean atomic percentages was recorded when a combination of CPP-ACP and laser was used. A maximum increase of the mean atomic percentage of both elements was recorded when the laser was applied first followed by CPP-ACP agent. The combination of laser therapy followed by CPP-ACP application is recommended as efficient preventive measure for remineralizing initial caries – like lesion in permanent teeth. Also the use of 0.852 watt for 5 seconds was efficient in enhancing morphological and chemical changes in the enamel surface without thermal damage.

**Keywords:**Enamel; EDS; CO<sub>2</sub> laser; SEM; CPP-ACP.

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