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"A comparative study on root surface demineralization using Citric Acid and Tetracycline in vitro: A scanning electron microscopy study "

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Abstract:

Citric acid and tetracycline HCl are the most common clinical root demineralization agents used in periodontal practice. In this comparative in vitro study the effects of Nd: YAG laser radiation on root surface was compared to that of citric acid and tetracycline HCl using SEM. A total of twenty-one freshly extracted periodontally diseased single rooted premolar teeth were root planned in vitro. The proximal surface of each root was sectioned and divided to two equal surfaces of experimental and control. In group "A" Nd: YAG laser a power of 2 watts was used for 2 minutes at 0 pps. In group "B" citric acid PH=1 was applied for 3 minutes & in group "C" 5% tetracycline HCl solution PH=3.3 was applied for 5 minutes. SEM results showed removal of smear layer, changes in surface characteristics and opening of dentinal tubules in all 3 groups when compared to controls. Nd: YAG laser group signs of surface cracking, pits and craters were observed and removal of smear layer was not complete at 2 watts power and tubular opening was minimal. In group "B" smear layer was completely removed, micro fractures were seen and large opening of tubules were observed. In group "C", more numbers of tubules were opened but openings were not large as in group B", smear layer completely removed and experimental surfaces were smooth and no micro fractures were seen. This study showed that Nd:Yag laser could be used for the purpose of root demineralization but it needs further investigations with modification in factors influencing laser effectiveness to be used as a common method of root surface demineralization.

Keywords:

Smear layer , Dentinal tubules , Citric acid , Tetracycline HCL , Demineralization

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