

Short Communication

Root Biomodification

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Periodontitis involves an inflammatory process of bacterial origin, affecting the periodontal tissue and provoking the destruction of supportive tissues of the teeth results in loss of connective tissue attachment around the tooth, loss of supporting alveolar bone, apical migration of junctional epithelium along the root surface.¹

Periodontally affected root surfaces are hyper mineralized, and contaminated with cytotoxic and other biologically active substances especially endotoxins which play a pivotal role in preventing new connective tissue attachment to the exposed root surface. Following root planing the instrumented root surface is invariably covered by smear layer containing remnants of dental calculus, contaminated root cementum, bacterial endotoxin and sub gingival plaque.²

Periodontal therapy is regeneration of an organized, functional fibrous attachment to previously diseased root surfaces. In the last few years, animal and human studies involving demineralization of planed root surfaces have reported clinical and histological evidence of cementogenesis and new connective tissue attachment.³

The oldest and most frequently type of

periodontal regeneration attempted has involved chemical modification of root surface. Since the late 19th century when Marshall introduced aromatic sulfuric acid into periodontal pockets modification of root surface through decalcification has been directed to create an area that is compatible for connective tissue attachment.⁴

Thus this regeneration procedure is to determine the alteration in diseased root surface that would create an appropriate and hospitable surface for cell attachment and eventual development of fiber attachment. The rationale for this approach was that a 3 major requirement for regeneration of connective tissue attachment to a denuded, Periodontitis affected root is migration and attachment of connective tissue cells to the root surface.⁵

The root surface biomodification with chemical agents, in conjunction with scaling and root planing, improves gingival attachment.⁶ These agents remove the smear layer, exposing collagen fibres on the dentin matrix and eliminating cytopathic substances that inhibit human gingival fibroblast growth. Various agents have been used for chemical root surface conditioning. The use of root conditioners for the radicular surface helped debridement to achieve a

more compatible biological substrate.

These include root conditioners citric acid, tetracycline HCl, EDTA, phosphoric acid, and hydrogen peroxide, enamel matrix proteins, recombinant human growth factors, platelet-rich plasma, and dentin bonding conditioner, enamel matrix proteins. In addition to chemical conditioning, the applicability of different laser systems, such as the CO₂, Nd:YAG diode, and Er:YAG laser in the removal of the smear layer has been employed⁷. In addition to the above fibronectin⁸, laminin⁹, chlorhexidine have also been used for root biomodification.

The ultimate goal of periodontal treatment seek to preserve the teeth in relatively functional and comfortable good health, and the same time maintaining the aesthetic expectation of the patient. To achieve this goal, root biomodification incorporated along with other periodontal procedures has proven very beneficial.

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