

AAP Statement on the Efficacy of Lasers in the Non-surgical Treatment of Inflammatory Periodontal Disease

Clinical application of lasers for the treatment of periodontal disease has continued to expand since their introduction for this purpose in the early 1990s¹⁻⁹ but remains controversial.¹⁰⁻¹⁸ The primary purpose of this Statement is to provide an evidence-based perspective on three of the purported benefits of using lasers in the non-surgical treatment of periodontal disease, i.e., sulcular and/or pocket debridement (a.k.a. laser curettage), reduction of subgingival bacterial loads (a.k.a. pocket sterilization), and scaling and root planing (SRP).

Laser Mediated Sulcular and/or Pocket Debridement

If one considers the clinical parameters of reductions in probing depth or gains in clinical attachment levels, the dental literature indicates that when used as an adjunct to SRP, mechanical, chemical, or laser curettage has little to no benefit beyond SRP alone.¹⁰⁻¹⁷ The available evidence consistently shows that therapies intended to arrest and control periodontitis depend primarily on effective debridement of the root surface and not removal of the lining of the pocket soft tissue wall, i.e., curettage.^{18, 19} Currently, there is minimal evidence to support use of a laser for the purpose of subgingival debridement, either as a monotherapy or adjunctive to SRP.¹⁰⁻²²

Reduction of Subgingival Bacterial Levels

Current evidence show lasers, as a group, to be unpredictable and inconsistent in their ability to reduce subgingival microbial loads beyond that achieved by SRP alone.¹⁰⁻¹⁷ Further, this conclusion also appears to apply to the use of photodynamic therapy, either as a monotherapy or adjunctive to SRP).²³ At best, the evidence is lacking or conflicting. For example, of the 10 published clinical trials only 2 showed PDT to be effective in reducing subgingival microbial loads, 4 reported no difference and 4 did not measure reductions in microbes.¹⁷

Scaling and Root Planing

Erbium lasers show the greatest potential for effective root debridement (SRP). The Er:YAG laser has been shown, in vitro, to remove calculus¹² and to negate endotoxin.^{12, 15, 24, 25} There is the potential for root surface damage during the process of in vivo calculus removal since the Er:YAG is a hard tissue laser and the operator would not be able to

visualize what is being lased. Clinical data on attachment level changes when compared to SRP alone is conflicting with some studies showing a slight benefit while others show no benefit. Further study is needed to determine if laser assisted SRP has a beneficial effect.

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