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Case Study

Clinical Case Evaluating Improved Gingival and Periodontal Health Indices After Laser Therapy and Local Antibiotics as an Adjunct to Periodontal Therapy

Dr. Shilpi Priyadarshini DDS, MPH, FICOI[1]*, Dr. Gaurav Tyagi DDS[2], Abigail Lewis RDH[3], Dr. Heidi Stubblefield DDS[4] and Ashish Veerji[5]

[1] *Jefferson Dental and Orthodontics, USA.*

[2] *Prosthodontist, Luminescence Dentistry, USA.*

[3] *Jefferson Dental and Orthodontics, USA.*

[4] *Jefferson Dental and Orthodontics, USA.*

[5] *North Garland High School, USA.*

***Corresponding Author:** Dr. Shilpi Priyadarshini, DDS, MPH, FICOI, Jefferson Dental and Orthodontics, USA.*

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Abstract

The article describes a case study of a 39-year-old male patient who presented to the clinic with pain on lower right side of the mouth. The patient had a medical history of hypertension and ulcerative colitis, and social history negative for smoking, alcohol, and any other recreational drug usage. A diagnosis of Chronic Generalized stage II adult periodontitis (Grade B) was made, and a treatment plan of therapeutic scaling and root planning was recommended, along with laser therapy and Arestin in the localized areas of deep pockets. Laser assisted periodontal therapy (LAPT) was initiated using [3]Biolase Epic H 940 nm diode laser, and the patient received Arestin on specific sites. The article highlights the importance of oral health as a window to systemic health and emphasizes the need for dentists and physicians to actively introduce the mouth-body connection in their patient care regime. The article also emphasizes the importance of eliminating bacteria and developing treatment plans that include continuous maintenance care. With the advent of laser technology for intraoral use, periodontal therapy coupled with laser therapy and localized antibiotics lead to more predictable healing outcomes with minimal post-operative complications.

***Keywords:** Periodontal therapy; Laser therapy; mouth- body connection.*

Introduction

Oral health is a window to the systemic health of the patient. The need for dentists and physicians to actively incorporate the mouth-body connection in their patient care regime is imperative. Periodontal health is the foundation of good and sustainable oral health, and the pathogenicity of periodontal disease is multifactorial. Treatment modalities that include traditional curettage of the infected tissue, biostimulation with laser, and localized antibiotic therapy has led to increased healing outcomes. The periodontal bacteria that colonize in the gums can lead to exacerbation of various systemic conditions, such as Alzheimer's, obesity, diabetes, rheumatoid arthritis, osteoporosis, and cardiac conditions. [1]

It is not only important to eliminate bacteria but also to develop treatment plans that include continuous maintenance care. With the advent of laser technology for intraoral use, periodontal therapy coupled with laser therapy and localized antibiotics has led to more predictable healing outcomes with minimal post-operative complications.

Case Study

This article describes a case study of a 39-year-old male patient who presented to the clinic with pain on lower right. A comprehensive examination was conducted, including a full mouth series of radiographs and an intraoral ITERO 3D scan (Figure 3). A complete radiographic (Figure 1) and periodontal evaluation (Figure 2) was performed using [1]Overjet, an FDA-approved artificial intelligence platform that detects calculus and decay and quantifies bone loss on radiographs, allowing for comprehensive diagnosis by providers. Overjet is also a useful visualization tool for patients and helps them understand the extent and severity of disease in their mouth.

The patient had a medical history of hypertension and ulcerative colitis, and social history negative for smoking, alcohol, and recreational drug use. The periodontal examination revealed slight horizontal blunting of papilla, generalized supra and sub gingival plaque and calculus build up, generalized bleeding on probing and inflamed papillae. A diagnosis of Generalized stage II chronic generalized adult periodontitis (Grade B) was made based on the criteria established by the American Academy of Periodontology.

A treatment plan of therapeutic scaling and root planning was recommended, along with laser therapy and [4]Arestin in the localized areas of deep pockets. The patient accepted the recommended periodontal therapy, and the initial treatment was conducted on the left side of the mouth on the day of the examination, followed by the right side of the mouth after three days (Figure 4). Laser-assisted periodontal therapy (LAPT) was initiated using the Biolase Epic H 940 nm diode laser, with a E4-7mm tip at .8 watt average power on pulsed mode using a non-initiated tip. The total usage time was 5 mins on each half of the mouth. The patient also received Arestin on specific sites.

Figure 1: *Panoramic radiograph.*

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CAL	5 6 6	7 5 7	5 4 6	6 3 6	6 3 4	4 4 6	6 6 5	5 6 5	5 5 4	4 5 5	5 3 5	5 3 7	6 3 7	6 4 8	6 5 7	7 6 6
MG	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
T#	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17

Figure 2: *Complete periodontal chart.*

Figure 3: *Pre-op Intraoral ITERO 3D scans.*

Figure 4: *Three days post op picture showing healing on the left side of the mouth after periodontal therapy and LAPT. Treatment had not been initiated on the right side.*

Figure 5 : *Post operative picture after completion of periodontal therapy of whole mouth.*

Discussion

As evident in Figure 4 and 5, improved healing outcomes were noticed in all indices including bleeding index, texture of the papilla and sensitivity just 3 days after treatment.

Micro-organisms found in inflamed periodontal tissue has been found contributory to increase risk of many systemic conditions like heart disease and stroke mainly by contributing to the buildup of plaque in the arteries.

Chronic periodontal inflammation also leads to worsening of Type II Diabetes by increasing insulin resistance of the body, has been linked to worsening of respiratory diseases like pneumonia, chronic obstructive pulmonary disease (COPD), low birth weight, premature birth in pregnant women including premature labor and delivery. Recent evidence has also pointed out links of periodontal bacteria with pancreatic, kidney and blood cancers. It is hence imperative to control gingival and periodontal bacteria and curb disease progression at an early stage.

Laser therapy has proven beneficial in healing tissues in multiple ways. [2] Reduction of inflammation, elimination of bacteria, regeneration of tissues and sealing of capillaries are the major pathways by which laser therapy accelerates healing outcomes on patients. Laser energy is targeted on the diseased tissue area which is absorbed by the pigmented cells (hemoglobin and melanin) and converted into heat that stimulates healing and regeneration. The process is minimally invasive, and patients experience little to no discomfort during the process. Arestin therapy has been very beneficial in targeting localized deep pockets. [1,3,4]

Conclusion

Adjunctive therapies like laser and Arestin when coupled rightly can accelerate the healing outcomes of the patients. These therapeutic modalities are quick, painless (minimal to no anesthesia needed, often handled with topical numbing gel). The process involves no complex postoperative care and in fact accelerate the recovery by shortening the duration of healing time. Dentists should aim at developing treatment modalities that aim at eliminating gingival/periodontal bacteria, decrease recovery times, stimulate healing of tissues, reduce post operative complications, and quickly improve the health of the periodontium in a way that makes it easier for patients to maintain hygiene.

Conflict of Interest

The authors declare no conflict of interest.

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