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Case Reports

Nonsurgical Periodontal Treatment by Erbium: YAG Laser Promotes Regression of Gingival Overgrowth in Patient Taking Cyclosporine A: A Case Report

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Abstract

Objective and background: To report on a case of cyclosporine A-related gingival overgrowth (GO) treated by conventional scaling and Erbium:YAG laser that unexpectedly showed complete healing with normalization of the gingiva, making unnecessary further surgical treatment for gingival volume reduction. Since Erbium:YAG laser was approved in 1997 by the U.S. Food and Drug Administration for hard and soft tissue treatments in dentistry, several studies have been published to demonstrate its efficacy for bone cutting, plaque and subgingival calculus removal, and antiseptic effects both on soft and hard periodontal tissues.
Methods: We report herewith the case of a patient undergoing cyclosporine A therapy, affected by GO who underwent scaling and full mouth disinfection with chlorhexidine 2% rinses, followed by Erbium:YAG laser treatment of gingival pseudopockets, without surgical removal of the overgrown gingiva.
Results: Unexpectedly, complete healing of the periodontal tissues was observable after one single laser application and no adjunctive surgical procedure was necessary.
Conclusions: Erbium:YAG laser could be considered a really effective option for the nonsurgical treatment of drug-induced GO, avoiding the surgical procedures and also promoting a fast healing and a patient compliance surely higher than conventional techniques.

Keywords: Erbium:YAG laser, nonsurgical periodontal treatment, gingival overgrowth, cyclosporine A, kidney transplantation

Introduction

Immunosuppressant treatment by Cyclosporine A (CsA) frequently is associated with diffuse or partial gingival overgrowth (GO), which can interfere with speaking, biting, and lead to partial or complete masking of the teeth by the overgrown gingiva representing also a true aesthetic problem.[1,2]

In the past, surgical remodeling of the overgrowing gingiva represented the elective treatment for such lesions, such procedures being characterized by massive intraoperative bleeding, slow healing, and low compliance of the patient.[1,2]

The introduction of laser-assisted surgery in general dentistry, periodontology, and oral surgery, in view of the excellent performance for the excision of oral tissues, hemostatic action, and faster healing, turned out as a real revolution in the surgical management of GO and also in the postsurgical maintenance of good periodontal status in such patients.[3,4]

Recent published studies confirm the therapeutic effects of laser therapy as an adjunct to conventional scaling and root planing in the treatment of aggressive periodontitis in terms of a significant reduction in some clinical parameters[5]; in addition, also in the management of periodontal conditions needing bone and gingival remodeling, such as surgical crown lengthening,[6] or needing bone, radicular cementum, and soft tissue debridement as in the case of lateral periodontal cysts,[7] resulting in the diode laser treatment in a shorter wound-healing period.

Despite distinct therapeutic options, as mentioned above, in the current case of CsA-related GO, unexpectedly the

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FIG. 1. GO in patient taking CsA for renal transplantation; dental crowns are partially covered by overgrown gingiva that is generally diffuse in the maxilla and partially in the mandible; plaque is abundant. CsA, cyclosporine A; GO, gingival overgrowth.

complete healing of the overgrown gingiva was detected after periodontal treatment by Erbium:YAG laser only, without the need of surgical excision of the exceeding gingiva.

Case Presentation

We reported on a case of a 45-year-old Caucasian man undergoing CsA for kidney transplantation for over 4 years referred to our attention for a generalized GO; nonetheless, the patient was in good general health. Clinically, GO was more severe on the upper jaw, which affected almost all teeth, while in the mandible only a mild overgrowing gingiva was detectable (Fig. 1); plaque was abundant and it was strictly related to the difficulties occurring in home oral hygiene also complicated by copious bleeding. Panoramic radiograph confirms the presence of the classic pseudogingival pockets all over the affected sites (Fig. 2); no gingival index was revealed and no periapical radiograms were performed as the surgical excision of the gingival masses, after periodontal presurgical decontamination, had already been planned.

FIG. 2. Panoramic radiograph demonstrates the presence of diffuse pseudogingival pockets; no periodontal bone lesions are detectable.

FIG. 3. Clinical appearance after nonsurgical periodontal therapy by Erbium:YAG laser of all pseudogingival pockets.

Therefore, the patient underwent full mouth disinfection with chlorhexidine 2% rinses and antibiotic prophylaxis (amoxicillin and clavulanic acid, 1*g* twice a day) during the week before conventional scaling and Erbium:YAG treatment [key laser 3; kavo-Biberach-Germany, wavelength 2940 nm, standard scalpel long tip for contact use with irrigation, 160 J at 10 H (1,6 W), 60 sec for tooth] of the pseudogingival pockets (Fig. 3). The treatment was performed by using the laser tip in contact with the internal aspect of the exceeding gingival tissue and with the gingival sulcus at the deepest point of the pseudopockets. A follow-up was set on waiting for the surgical gingival excision that had already been planned to be performed by diode laser to achieve a good intraoperative hemostasis.

After 3 weeks a partial reduction of the exceeding gingiva was detectable, gingival bleeding was absent, and oral hygiene was improved (Fig. 4). Subsequently, the patient was monitored every 2 weeks to perform the gingival excision Nevertheless, after 2 months, the patient presented complete healing of the GO, the gingiva was normally colored, plaque and bleeding were absent (Fig. 5) and diode laser excision was no longer deemed. The posttreatment course was uneventful and the patient remained in good conditions.

Discussion

In the reported case an unexpected reduction of the exceeding gingiva was detectable after a nonsurgical

FIG. 4. Clinical appearance 3 weeks after treatment: good reduction of inflammation and GO is observable.

FIG. 5. After 2 months, during clinical follow-up, no signs of periodontal inflammation were detectable and gingiva showed a normal appearance; for this reason, no additional surgical procedure has been necessary.

Erbium:YAG laser periodontal treatment of the pseudogingival pockets.

Drug-induced GO is an adverse effect of the systemic treatment by immunosuppressive agents, antiepileptics, and calcium (Ca2+) channel blockers, although its pathogenesis still remains unclear.[1,2,8–10]

In CsA-induced GO, the etiopathogenic mechanism probably is related to the high drug concentration into the gingival tissues through the crevicular epithelium, thus promoting a direct or indirect outgrowth of both gingival fibroblasts and epithelial cell, regulated by cytokines and growth factors[9–11]; the subsequent easier plaque and calculus accumulation creates a gingival inflammation resulting into an exacerbation of the GO.[6,8]

The conventional surgical treatment by blade of GO has always been a true dilemma for oral surgeons in the past since it is usually characterized by massive intraoperative bleeding, difficult postoperative course for patients, and often recurrence in a short time.

The introduction of different laser wavelengths (e.g., erbium:yttrium–aluminum–garnet laser, neodymium:yttrium–aluminum–garnet laser, carbon dioxide laser, and the semiconductor diode laser) for such surgical treatments of soft oral tissues resulted in several advantages for both clinicians and patients; in fact, bleeding can be reduced or totally avoided during surgery, healing is faster as promoted by laser light photobiomodulation of the tissues,[3,4,12] thus resulting in a high compliance both of adult patients and children.[13–15]

More specifically, the Erbium:YAG laser used for periodontal treatments in the presence of gingival pockets, being more selective for water, is able to remove simultaneously calculus from radicular cementum and inflamed soft tissue within the pocket, and to remodel the gingival margins when necessary, also promoting in addition decontamination and photobiomodulation of all irradiated surfaces.[3,5,9,12]

The described case with the unexpected healing of the gingiva, illustrates a possible real innovation for treatment of drug-induced GO being the first reported case of CsA-related GO treated by Erbium:YAG laser for the nonsurgical periodontal decontamination of the pseudogingival pockets and not for excision of the overgrowth gingiva.[14,15]

In fact, among laser users and scientific societies, it is generally accepted that Erbium:YAG laser is considered the more fit laser for the not-surgical periodontal treatments, as this treatment is easy to perform, noninvasive, and well accepted by the patients.[3,4,13]

In fact, more specifically, Erbium:YAG laser is able to contour and cut the alveolar bone with minimal damage and has high antiseptic effects due to reduction of lipopolysaccharides both in soft and hard tissues.[3,4] At same time, Erbium:YAG laser also induces tissue photobiomodulation, which leads to faster healing as a result of cell proliferation and improved microcirculation.[12]

Conclusions

A great part of the scientific community of laser users agreed that Erbium:YAG laser, thanks to its intrinsic physical properties, is an excellent tool for periodontal treatments. In addition, in view of the results obtained in the current case, we suggest that Erbium:YAG laser may be successfully employed for drug-induced GO in consideration of the simplicity of the technique and the increased compliance of the patient.

We hope that wider adoption of such noninvasive effective treatment protocol will confirm Erbium:YAG laser treatment efficacy for GO, and also for periodontal maintenance in such patients and for recurrence of GO, further reports and clinical studies are still needed.

Summary

This report focuses the attention on a new procedure for the management of drug-induced GO that remains a frequent complication of several drug therapies (immunosuppressive agents, antiepileptics, and calcium channel blockers), surely exacerbated by plaque and calculus accumulation. Erbium:YAG laser treatment associated with the conventional calculus scaling could be considered a new modality for the nonsurgical treatment of drug-induced GO, promoting a good patient compliance and making the surgical procedure of gingival excision/reduction no longer necessary.

Author Disclosure Statement

No competing financial interests exist.

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