



An Alternative to Conventional Periodontal Surgery

A look at a minimally invasive approach using the LANAP® protocol

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The oral and systemic benefits of a healthy periodontium are well established.^{1,2} Public awareness is relatively high, yet many patients who need treatment avoid it due to fear of conventional interventions. Periodontal laser surgery offers an evidence-based alternative to conventional periodontal surgery with little postoperative discomfort and minimal loss of tissue height and volume. Apprehensive patients tend to be more receptive to this minimally invasive approach.

This article examines the evidence behind and advantages of using the PerioLase® MVP-7™ (Millennium Dental Technologies, www.lanap.com) for the LANAP® protocol and presents case examples of excellent outcomes from the author's practice.

The LANAP Protocol

The LANAP protocol approach to regeneration is far different from conventional regenerative procedures where flap reflection, removal of granulation tissue, placement of a bone graft, and suturing are the norm. With the LANAP protocol, granulation tissue is disinfected and retained, and healing is facilitated to allow a periodontal lesion to respond similarly to an endodontic lesion.

Few question the ability of endodontic therapy to influence the post-treatment reossification of granulation tissue. By effectively

detoxifying, sealing, and stabilizing a periodontal lesion, the well-defined LANAP protocol initiates a similar response. The initial laser pass provides access, visibility, and de-epithelialization, with some bacterial kill—without damaging adjacent healthy tissue. Definitive root surface detoxification is accomplished via exposure to pulsed Nd:YAG laser energy from the PerioLase MVP-7 followed by scaling and root planing with a series of specific piezo-electric tips and hand instrumentation.

After bone modification under the periosteum, the blood in the pocket is congealed with Nd:YAG laser radiation using a proprietary long-pulse duration, which seals the pocket with a thermal fibrin clot and facilitates a “closed” wound. Occlusal trauma is then assessed and addressed with occlusal adjustment to provide stability of the attachment apparatus during healing. In cases of extreme mobility, dental splinting may be warranted.

The Evidence Base

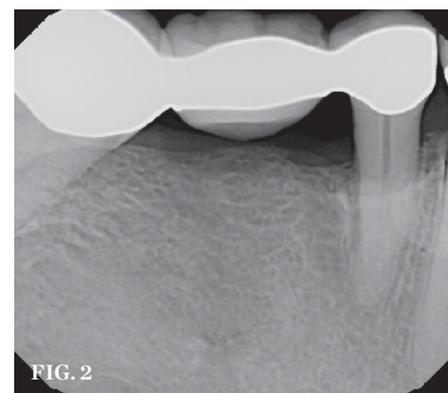
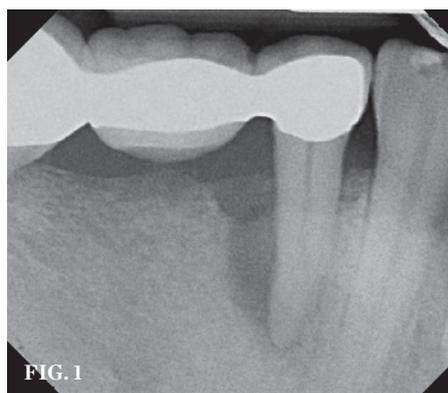
Two human histologic studies have documented the ability of the LANAP protocol

to create new periodontal attachment, including bone regeneration, on a routine basis. With human histologic evidence, Yukna and colleagues^{3,4} in their 3-month study showed the LANAP protocol resulted in cementum-mediated new connective tissue attachment 100% of the time, as opposed to 17% in the control teeth, which were treated with scaling and root planing alone. In their 9-month investigation, Nevins and colleagues⁵ obtained highly successful results in treating patients with severely involved multirooted teeth that ordinarily would have been deemed hopeless. The significance of two human histologic studies documenting efficacy can neither be overstated nor ignored. These histologic studies are complemented by the improvements in clinical indices reported by the same authors.^{6,7}

In addition, close to 2,000 clinicians have reported consistent and reproducible clinical successes with the LANAP protocol. There are 375 published cases of positive patient outcomes, most with radiographic and some with histologic demonstration of bone growth,



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(1.) Case 1 pretreatment radiograph showing 12-mm probing depth on the distal aspect of tooth No. 29. **(2.)** Case 1 post-treatment radiograph showing 3-mm postsurgical probing depth on tooth No. 29 at 5 years.

using the LANAP protocol.⁸⁻¹⁸ These cases are exhibited in a variety of publications and, considered together, are a significant contribution to establishing efficacy, particularly in conjunction with the aforementioned human histologic studies. A recent microbiologic study by McCawley and Rams¹⁹ documented the ability of the LANAP protocol to immediately suppress putative periodontal pathogens below culture detection limits. This may be an important factor in the favorable clinical and histologic regenerative changes that are routinely observed.

Advantages

The LANAP protocol offers advantages over conventional surgery when treating certain medically compromised patients. Due to the minimally invasive nature of the protocol and the hemostatic capacity of the Nd:YAG laser, discontinuing anticoagulation therapy is ordinarily not needed. The minimally invasive aspect of the LANAP protocol benefits patients and practitioners in other ways as well. Compared to conventional surgery, the LANAP treatment typically requires lighter anesthesia or sedation, making the experience more comfortable for the patient and easier to accomplish for the clinician. This is an important consideration, especially for fragile patients whose health status (eg,

heart conditions or arrhythmias) may contraindicate the administration of epinephrine. Significantly, the LANAP protocol may provide a treatment alternative for high-risk patients who are not good candidates for conventional periodontal surgery.

In addition to addressing periodontal destruction in the natural dentition by the LANAP protocol, the related LAPIP™ protocol is used to treat peri-implantitis and peri-mucositis. The approach is similar in offering reversal of disease in a patient-friendly surgery using the PerioLase MVP-7 and piezo tips. This unique protocol uses techniques, parameters, and light dose appropriate to avoid overheating the implant fixture and supporting tissues. Although somewhat less predictable, bone regeneration, probing depth reduction, and improvement in tissue tone have been demonstrated and documented by numerous clinicians.²⁰

Case Examples

Four cases are presented here—three that demonstrate favorable results using the LANAP protocol and one case with the LAPIP protocol. All patients were treated solely by the author.

Case 1

A 68-year-old man presented with 12-mm probing depth on the distal of tooth No. 29 (Figure 1). The tissue was edematous and erythematous prior to treatment. This patient demonstrated severe bone loss throughout his maxillary arch, and full-arch extraction had been recommended. He refused, and requested laser therapy on the maxillary arch despite the poor prognosis.

Therapy resulted in substantial bone regeneration and a postsurgical probing depth of 3 mm with excellent tissue tone. This type of defect lends itself well to regeneration of any sort; however, the amount obtained in this case was impressive. Additionally, no regenerative materials were used, so cost to the patient was minimized. Although the presentation remains less than ideal, the patient has continued to maintain all teeth in his maxillary arch for 5 years (Figure 2).

Case 2

A 41-year-old man presented with generalized periodontitis (Figure 3). Teeth Nos. 24 and 25 were assessed to be hopeless; however, it was felt that peripheral bone could be regenerated if the sites were treated prior to extraction. The pulps of both teeth tested positive. The radiographic and clinical response



(3.) Case 2 pretreatment radiograph showing more than 9-mm probing depth on all aspects of teeth Nos. 24 and 25. **(4.)** Case 2 post-treatment radiograph showing 3-mm probing depths circumferentially at 7-month follow-up. **(5.)** Case 3 pretreatment radiograph showing 14-mm probing depths on distolingual aspects of tooth No. 6. **(6.)** Case 3 post-treatment radiograph showing 4-mm probing depth at 4.5-year follow-up.

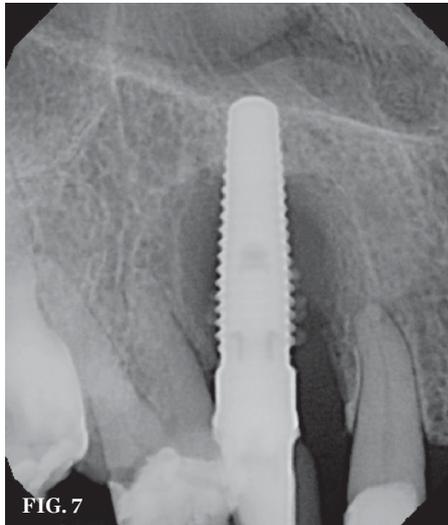
(probing depths within normal limits) to treatment surpassed expectations. Dental splinting was utilized to provide stability during and after surgery. The teeth have been maintained for 4 years (Figure 4).

Case 3

A 40-year-old male patient presented with severe periodontal involvement associated with tooth No. 6 (Figure 5). There appears to be periapical involvement in the preoperative radiograph; however, the tooth pulp tested positive. The periodontal defect was to the palatal aspect and treatment resulted in resolution. Figure 6 shows the follow-up radiograph almost 5 years after treatment.

Case 4

A 61-year-old female patient presented with a failing implant at position No. 6 (Figure 7). Due to severe bone loss and profound tissue inflammation, removal was suggested; however, the patient insisted we attempt treatment. Results surpassed expectations (Figure 8). Probing depths on the buccal improved from 14 mm to 3 mm with no bleeding on probing. Pundits claim that due to a lack of “true



(7.) Case 4 pretreatment radiograph showing failing implant in tooth position No. 6.



(8.) Post-treatment radiograph showing 3-mm probing depths at 14-month follow-up.

reintegration,” the prognosis is not improved in a case like this; however, this radiographic documentation suggests otherwise.

Conclusion

The LANAP protocol is a well-documented and very specific recipe for success. The

PerioLase MVP-7 is intimately associated with the protocol and the results discussed in this article apply specifically to this free-running pulsed Nd:YAG laser. Advantages of periodontal laser therapy over conventional surgery include less recession and loss of tissue volume, a documented reduction in



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postsurgical discomfort, reduced cost, and reduced treatment time. Patients who are aware they need treatment but are unwilling to undergo conventional therapy are often receptive to this minimally invasive alternative. Human histologic and microbiologic studies establish the LANAP protocol as an evidence-based treatment modality.

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