

Case Report**“LANAP”- A new hope in the treatment of Periodontitis**

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Abstract: Traditional surgical techniques have been successful in facilitating access and addressing the goal of “pocket elimination.” However, such surgical methods often result in unpleasant side effects, which can be painful and disfiguring. Laser technology, specifically the diode laser is gaining popularity in general dental practice with potential benefits in a wide range of applications. Lasers have been applied for hard and soft tissue debridement, contouring as well as the bacterial load reduction in the pocket. The breakthrough Laser-assisted New Attachment Procedure (LANAP) offers many advantages over conventional flap periodontal surgery or scaling and root planning for the treatment of periodontitis. Here the case report presents the LANAP procedure with uneventful healing.

Keywords: Debridement; Diode; Laser; Periodontitis; Pocket.

INTRODUCTION

Periodontitis is a relatively common disease. The ultimate goal of periodontal therapy is the formation of a new connective tissue attachment & re-growth of alveolar bone. This new connective tissue attachment can only be achieved when the epithelial migration can be prevented on the treated root surface. Over the years, various modes of therapy have been suggested to avoid epithelial migration, which includes soft tissue curettage, various types of flap procedures including modified Widman flap, guided tissue regeneration and, more recently lasers.¹

More than 10 years ago, Drs. Robert Gregg and Del McCarthy published research on the use of a specific free-running pulsed Neodymium-Doped:Yttrium–Aluminum–Garnet (Nd:YAG) laser for the treatment of periodontal disease. An Nd:YAG laser was developed that operates at a wavelength of 1,064 nm to deliver the therapeutic Laser-assisted New Attachment Procedure (LANAP). The formal definition developed for LANAP is “cementum-mediated new attachment to the root surface in the absence of a long junctional epithelium.” A thin 0.3 to 0.4 laser fiber permits easy access deep into the periodontal pocket without the need to surgically elevate a flap.²

The breakthrough LANAP offers many advantages over conventional flap periodontal surgery or scaling and root planning for the treatment of periodontitis. This no-cut, no-sew technique is bringing revolutionary outcomes into the treatment.³

The LANAP procedure is a protocol that deals with inflammation, the infectious process, occlusion, tooth mobility, and an osseous component. Regeneration is a rather complex event and, as seen with guided tissue regeneration or scaling and root planning alone, can be very unpredictable. LANAP is predictable. LANAP utilizes a free-running (10- 6 seconds) pulsed Nd:YAG laser in place of a scalpel. Originally referred to as Laser-ENAP, LANAP has evolved to provide a minimally invasive alternative to flap surgeries.⁴

The potential for regeneration is facilitated by: 1) Delivering intense, precise, and selective energy to the affected area (periodontal pocket), without damage to adjacent tissues; 2) Being bactericidal to pigmented periodontal pathogens; 3) Sealing the pocket orifice with a “thermal fibrin clot”; 4) Creating a physical barrier (such as a barrier membrane), preventing down growth of epithelium; and 5) Promoting healing from the bottom up rather than the top down by stimulating the release of pluripotent cells from the PDL and alveolar bone.⁴ Here we present a case report of chronic periodontitis treated with the help of a new technique, Laser-assisted New Attachment Procedure (LANAP) with the help of Diode Laser resulting in significant pocket depth reduction and attachment gain.

CASE REPORT

A 34 year old male patient reported in the Department of Periodontics in Rama Dental College, Kanpur with a chief complaint of swollen & bleeding gums. No relevant

medical history was present. The oral hygiene status of the patient was poor with generalized gingival inflammation and generalized probing pocket depth of 7-8 mm. Complete periodontal examination was done and was diagnosed as Generalized Chronic Periodontitis. Routine hematological and radiological investigations were done.

Treatment started with thorough scaling and root planning (SRP) & Oral hygiene instructions were given. Patient follow up was done for 1 month at every 1 week interval to assess the oral hygiene maintenance by the patient (Fig 1). Gingival inflammation & swelling subsided with no bleeding on probing. Diode laser assisted periodontal surgery was performed in maxillary second quadrant (Fig 2).



Figure 1: One week After scaling & root planning irt to 2nd quadrant.



Figure 2: Placement of diode laser in the periodontal pocket

No local anesthesia was given & there was minimal or no bleeding during laser treatment. Periodontal dressing was given to avoid any food lodgment at the site during healing process. No antimicrobials were

prescribed. Patient was recalled after 1 week and healing was checked which was uneventful (Fig 3). Patient was motivated for oral hygiene maintenance procedure at each visit. Follow up was done at 1 & 3 month interval (Fig 4).



Figure 3: Healing of Periodontal tissues after 1 week



Figure 4: Healing of Periodontal tissues after 3 months

DISCUSSION

Based on Albert Einstein's theory of spontaneous and stimulated emission of radiation, Maiman developed the first laser prototype in 1960. The first application of a laser to dental tissue was reported by Goldman et al. and Stern and Sognnaes.⁵ Laser technology, specifically the diode laser is gaining popularity in general dental practice with potential benefits in a wide range of applications. Lasers have provided us with a potential alternative to simultaneously remove the diseased soft tissues, target the micro-organisms as well as stimulate wound healing. The diode laser is the most popular choice of laser technology for the general dental practitioner since it is economical, portable and convenient to use. In addition, since it has good tissue penetration, and is well

absorbed in pigmented tissues, it can specifically target the pigmented bacteria and granulation tissue.⁶ At a wavelength in the range of 800-980 nm it is well absorbed by pigmented tissues and so can selectively target the darkened, inflamed tissues and pigmented bacteria. In fact some trials have confirmed the bactericidal effect of the diode laser.^{5,7,8}

Study done by Edward R. Kusek et al.⁹ showed that 80% of the pockets treated using the diode laser were restored to a healthy pocket depth of 3 mm. Lobo and Pole⁶ in their study have concluded that the use of the diode laser for open flap debridement did not significantly benefit the treatment outcome. Another study done by Katuri¹⁰ indicates that, LANAP using neodymium: yttrium-aluminum-garnet laser (1064 nm) with SRP as an effective non-surgical periodontal therapy in the treatment of moderate periodontal pockets. Studies have shown decreased gingival bleeding,^{11,12} decreased inflammation and pocket depth,¹³ as well as decreased tooth mobility and decreased clinical attachment loss (CAL).

After SRP, the diode laser is used on the soft tissue side of the periodontal pocket to remove the inflamed soft tissue and reduce the pathogens. Research has demonstrated better removal of the pocket epithelium compared with conventional techniques.¹⁴ Many studies have shown increased reduction of bacteria (especially specific periopathogens) when diode lasers are utilized after SRP.^{8,15}

Laser therapy blocks the pain signals transmitted from injured parts of the body to the brain. This decreases nerve sensitivity and significantly reduces the perception of pain. It also increases the production and release of endorphins and enkephalins which are natural pain-relieving chemicals within our bodies. Some reports suggest that LANAP can be associated with cementum-mediated new connective tissue attachment and apparent periodontal regeneration of diseased root surface in humans. With the diode laser there is a reduced need for systemic or locally applied antimicrobials. This leads to fewer allergic reactions and antibiotic resistance.¹⁶

CONCLUSION: Laser Assisted Periodontal Therapy is non - invasive. Soft tissue diode laser is more effective and less traumatic than conventional surgical methods. Such technological innovations present opportunities for flexible treatment options to patients, and simultaneously enable clinicians to expand their level of skill. Since its ease of use and affordability have made it the predominant laser in the field periodontology, continued research and careful observation will be necessary to sustain the clinical findings.

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