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CASE STUDY

MANAGEMENT OF LOCALIZED AGGRESSIVE PERIODONTITIS USING LASER ASSISTED NEW ATTACHMENT PROCEDURE – A CASE REPORT OF 24 MONTHS FOLLOW UP

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ABSTRACT

Introduction: Traditional surgical techniques both resective and regenerative establish periodontal health addressing the primary goal of pocket elimination. Restoration of lost periodontal tissues rather than regeneration is being accomplished with untoward side effects which led to the advent of a newer non-invasive Laser assisted new attachment procedure protocol challenging the old paradigm of periodontal healing in the absence of guided tissue regeneration barriers(GTR) or bone grafting materials.

Materials and Methods: A female patient reported to the out patient department of periodontics, sibar institute of dental sciences with chief complaint of mobile teeth in posterior region and on intra oral examination probing pocket depths of 9-10mm were observed at 16,26,36,46. The details about the various treatment options available and their benefits and risks had been explained to the patient and it was decided to provide Laser assisted new attachment procedure. The initial step of Laser assisted new attachement protocol is bone sounding around each tooth with administration of local anesthesia to determine areas of osseous defects that cannot be seen radiographically. The first pass of Laser, termed troughing was passed at wavelength of 890 nm, 2 Watts, 150millisecs, around each tooth to remove diseased epithelium by forming a mini-flap followed by removal of calculus on root surface using piezoscalers. The further application of Lasers was done to enhance the ability to form a fibrin clot to close the mini-flap and to disinfect site again

Conclusion: Radiographic evidence of bone regeneration with attachment gain is observed postoperatively after 24 months.

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INTRODUCTION

The homeostasis of periodontal health is hampered by a polymicrobial disease known as Periodontitis (Bartold *et al*., 2013). Aggressive periodontitis (AgP) comprehend a group of rapidly progressive, rare and often severe forms of periodontitis characterized by distinctive tendency for cases to aggregate in families and an early age of clinical manifestations (Gjermo *et al*., 2009). The International Classification Workshop identified clinical and laboratory features deemed specific enough to allow sub classification of Aggressive periodontitis into generalized and localized forms (Armitage *et al*., 2010). Protocols for treating aggressive periodontitis are largely empirical.AAP guidelines for periodontal therapy states that goals of periodontal therapy "are to preserve the natural dentition, periodontal ligament, peri-implant tissue (Lang *et al*., 1999). A logical and regimented approach is needed to treat aggressive periodontitis. Conventional periodontal therapy alone is often limited and unpredictable. The rationale for surgery at localized aggressive periodontitis sites is based both on the difficulty of root instrumentation in deep pockets as well as a perceived need to remove tissue invaded by A. actinomycetemcomitans (Slots *et al*., 1999). Resective periodontal surgery is difficult to accomplish in Localised Aggressive periodontitis as adjacent teeth are unaffected which persuaded to use of regenerative materials including barrier membranes, Bone Grafts and wound-healing agents. Use of biologic mediators like Enamel Matrix Proteins, Platelet rich plasma and tissue engineering are the recent enhancements to regenerative procedures. Even with the fore-mentioned advancements, anticipated regeneration of periodontal tissues is still a sixty-four dollar question. The conventional surgical

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procedures though address the primary goal of pocket elimination whose ideal outcome is restoration of lost periodontal tissues rather than regeneration are being declined by both the patients and clinicians due to perceived and real side effects such as root exposure , gingival recession, and postoperative discomfort (Brown, 2013). This led to the emergence of alternative newer non-invasive treatment modalities. One such widely accepted treatment modality is the introduction of Lasers in Periodontics expediency being haemostatic effects, selective calculus ablation/bactericidal effects against periodontopathetic pathogens leading to improved treatment outcomes (Nevins *et al*., 2012). Recently introduced minimally invasive laser periodontal therapy utilizing the patented LANAP protocol was developed by Robert H Gregg, and Delwin McCarthy in 1989. This article presents a case report on how LANAP was used to treat a case diagnosed as Localized Aggressive Periodontitis. Histological studies conducted by Dr Ray Yukna, New attachment was found on all LANAP treated teeth and it's a safe protocol. The choice of diode lasers in LANAP is for their selective absorption in pigmented tissues (Kimmel, 2013). The protocol of LANAP is rather simplistic and predictable, which is actually cementum-mediated new attachment to root surface in the absence of long junctional epithelium. Selfregeneration of lost periodontal attachment and osseous structure resulted from periodontal disease is possible by passing a thin 0.3-0.4 laser fiber into deep periodontal pockets without elevating a flap. Selective thermolysis removes diseased, infected, inflamed epithelium. The emitted laser light energy is attracted to pigmented tissues and colored bacteria causing the destruction of periodontal pathogens. Hemostasis is achieved by the fibrin clot formed (Nevins *et al*., 2012).

Case report

A 12 year old female patient with no medical history reported to the outpatient department of Periodontics in May 2013 whose chief concern was mobile teeth in the upper back tooth region. Full mouth periodontal examination revealed Significant bleeding on probing (BOP) and 10-mm pocket on tooth #16 (Figure 1), and 9-mm pocket on tooth #26, 36, 46. OPG exhibited a marked arc shaped osseous defect on the mesial aspect of tooth #16,26,36,46 (Figure 2) and IOPA also exhibited a marked arc shaped osseous defect on the mesial aspect of tooth #16,26,36,46 (Figure 3). The above clinical findings suggest the patient with a diagnosis of LAP according criteria based on AAP Classification (Bartold *et al*., 2013). The details about the various treatment options available and their benefits and risks had been explained to the patient and it was decided to provide LANAP. The initial step of LANAP protocol is bone sounding around each tooth with administration of local anesthesia to determine areas of osseous defects that cannot be seen radiographically. The first pass of Laser, (Figure 4) termed troughing was passed at wavelength of 890 nm, 2 Watts, 150millisecs, around each tooth to remove diseased epithelium by forming a mini-flap followed by removal of calculus on root surface using piezoscalers. The further application of Lasers was done to enhance the ability to form a fibrin clot to close the mini-flap and to disinfect site again. The fibrin clot formed is stable for approximately 14 days which helps to keep the sulcus sealed against bacterial seepage because laser wounds heal by secondary intention, fibrin clot is compressed against root surface which enhances healing. Patient was kept on mild analgesic and antibiotic regimen for 5days. Radiographs were taken at 6, 12,24 months postoperatively.

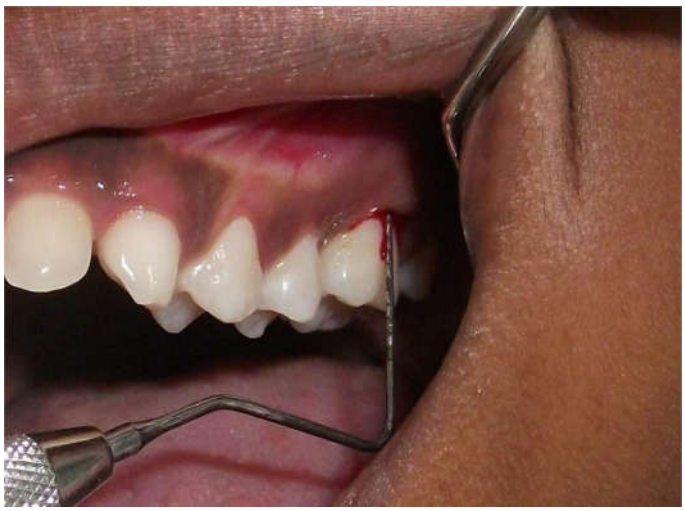

Figure 1. Preoperative clinical view 26

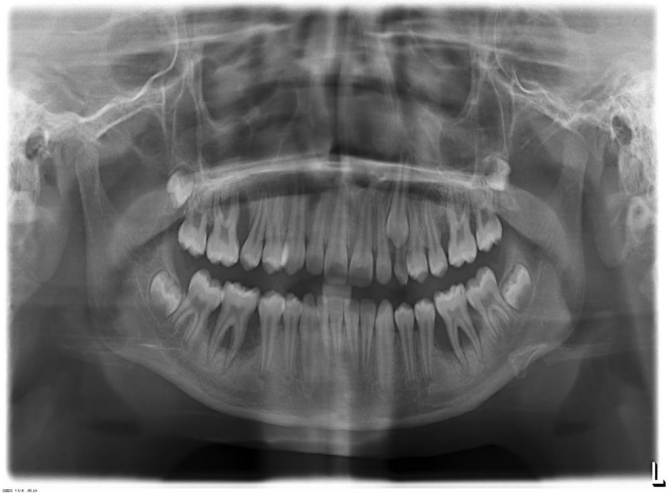

Figure 2. Preoperative OPG view

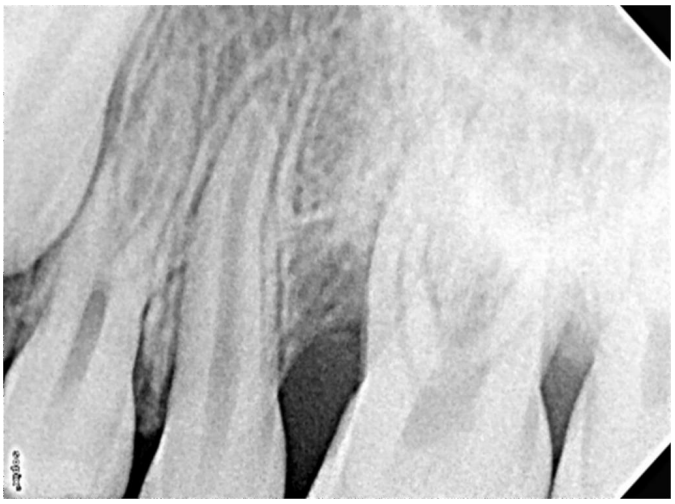

Figure 3. Preoperative periapical radiographic view

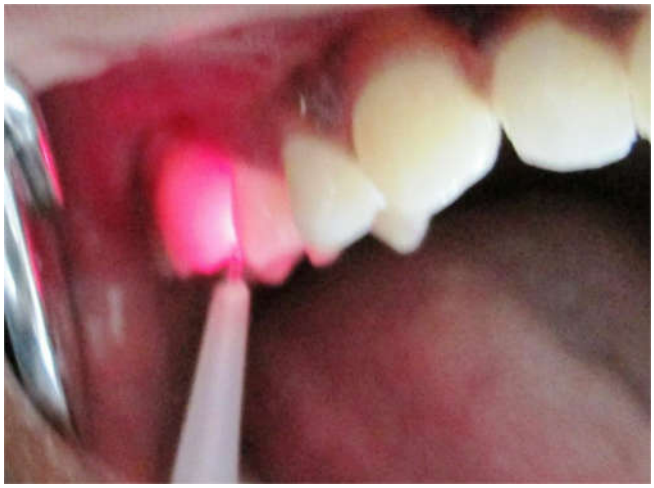

Figure 4. Laser application

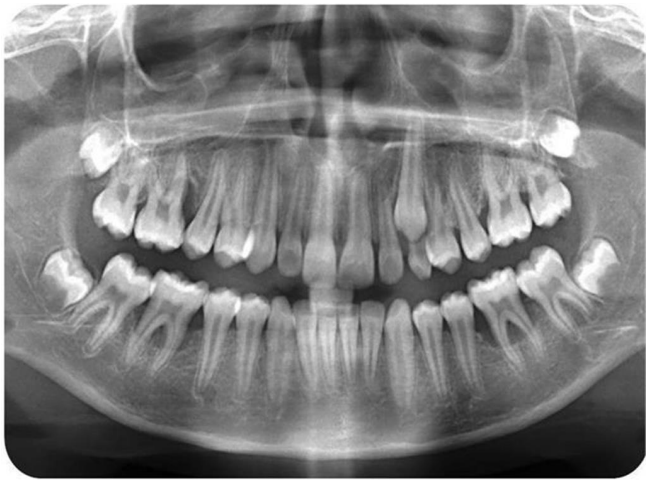

Figure 5. Postoperative OPG view after 12 months

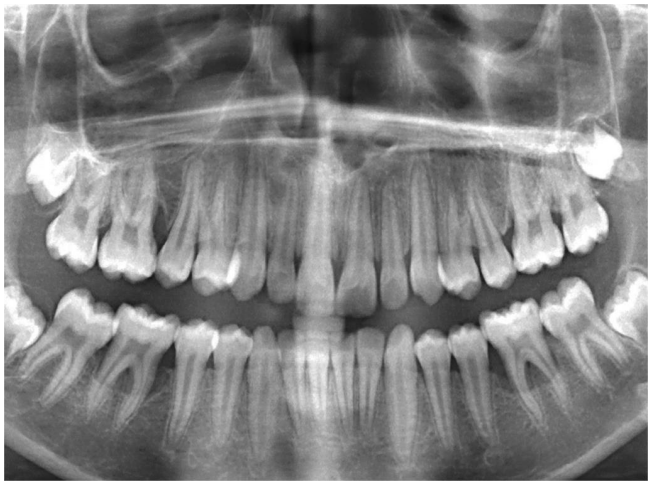

Figure 6. Postoperative OPG view after 24 months

Attachment levels at 12 months recorded a 4- to 5-mm attachment gain, which was maintained upto 24 months with radiographic evidence of bone regeneration (Figure 5 and 6). Postoperative intraoral periapical radiograph showed evidence of bone regeneration after 24 months (Figure 7).

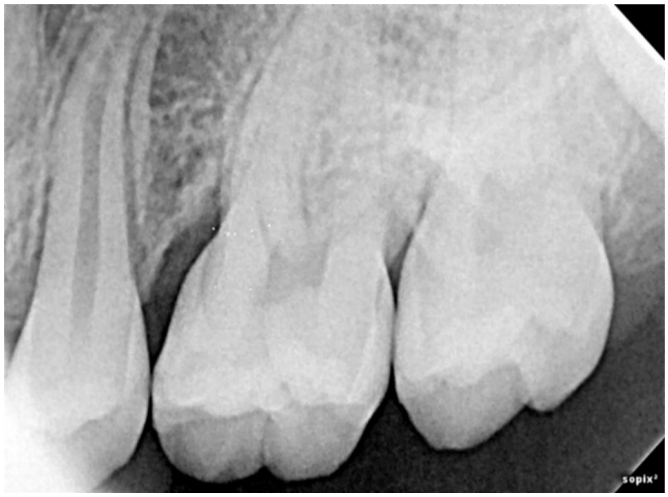

Figure 7. Postoperative periapical radiographic view after 24 months

DISCUSSION

Nowadays, laser assisted periodontal therapy is being widely used for the treatment of periodontal pockets. Laser mediated periodontal therapy has shown significant benefits from subgingival soft tissue curettage as well as in subgingival bacterial loads. This case report demonstrates and supports the efficacy of LANAP in the management of LAP by periodontal regeneration. Evidence of new attachment with new cementum and inserting collagen fibres is demonstrated in LANAP treated teeth (Kimmel, 2013). A favourable response in CAL gain and PD reduction is achieved by LANAP therapy (Nevins *et al*., 2014). In this case report there was a clinical attachment gain of about 4-5mm which was in accordance with Nevins and Yukna *et al*. McGuire *et al.* histologically evaluated the efficacy of LANAP in humans for the treatment of periodontal pockets and demonstrated periodontal regeneration and new Connective tissue attachment, considered LANAP was safe with minimal side effects such as dentinal hypersensitivity/recession and damage to the root surfaces (McGuire *et al*., 2011). A study by Cortellini and Tonetti demonstrated that likelihood of blood clot stabilization as a principle of periodontal wound healing for regeneration supporting the second pass of laser stimulates fibrin clot, which is essential for periodontal wound healing in LANAP protocol (Nevins *et al*., 2012). Nevins *et al* reported significant degree of periodontal regeneration with new periodontal ligament, cementum and alveolar bone in LANAP treated teeth. LANAP is considered as a safe procedure with minimal side effects such dentinal hypersensitivity or gingival recession with no damage to the root surfaces. It results in new Connective tissue formation. LANAP therapy has got substantial clinical and histological evidence with a very few case reports and case series though it was introduced 15 years ago. Treating periodontal disease with the aim of periodontal regeneration by LASERS, especially LANAP therapy is controversial.

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