

Comparative Analysis of Conventional Flap Surgery vs Laser Assisted Periodontal Flap Surgery: A Report of Two Cases.

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ABSTRACT

The objective of periodontal surgery is to restore periodontal health and to prevent further relapse. Traditionally scalpels were used in periodontal surgery. Recent advancements in laser have set a milestone in the field of periodontal surgery. So considering the above facts, the objective of this case series is to analyze the pre and post-operative results obtained between conventional periodontal flap surgery and diode laser assisted periodontal flap surgery. Two chronic periodontitis patients with generalized probing pocket depth of more than 7mm was selected for this clinical study. Both the patients had angular bone loss in the upper quadrant and generalized horizontal bone loss in the lower quadrant. So scalpel periodontal surgery was planned for the upper quadrant and diode- laser assisted flap surgery in the lower quadrant. Post-operative results based on clinical parameters and patient perspective were recorded. Clinically significant improvement in probing pocket depth and clinical attachment levels were observed in both the surgical sites. Patient acceptance and comfort were more in laser treated sites compared to conventional surgical sites.

Keywords: Chronic periodontitis, laser, scalpel surgery, open debridement.

INTRODUCTION

Chronic periodontitis is defined as inflammation of the gingiva extending into the adjacent attachment apparatus. The disease is characterized by loss of clinical attachment due to destruction of the periodontal ligament and loss of the adjacent supporting bone.^[1] Non-surgical periodontal procedures like scaling and root planning followed by periodontal surgical procedures are carried out to restore the periodontal health and function. Recent advancements like lasers, microsurgery and other treatment aids have set a milestone in the field of periodontics.^[2]

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Considering the above facts a comparative analysis on scalpel periodontal surgery and laser assisted periodontal surgery was carried out based on clinical and patient perspective.

CASE-SERIES

One male and one female patient of age around 35years who were diagnosed to have chronic periodontics were selected from the out-patient department of periodontics, Vinayaka Missions Sankrachariyar Dental College, Salem, Tamil Nadu, India for this analysis. The oral hygiene status of the patients were poor [Figure 1]. There was generalized gingival inflammation and generalized probing pocket depth of more than 8mm. There was diffused gingival enlargement. Angular bone defects were seen in relation to upper anterior. Visual-analogue scale pain was used to rate pain.^[2] The score was from 0-10. The scores were score 0 –no pain, 1-3-mild pain, 4-6-moderate pain and 7-10-severe pain. After a brief case sheet recording, scaling and root planning (SRP) was carried out. Oral hygiene instructions were given. One month post-operative results after SRP showed a drastic improvement in the clinical results. The probing pocket depth came down to 6mm [Figure 2]. Gingival inflammation and swelling reduced. Gingival consistency became firm and fibrous. Routine hematological and radiological investigations [Figure 3] were done. Diode laser assisted periodontal surgery was performed in the lower quadrant as shown in [Figure 4]. No local anesthesia was given. Surgery was planned in the consecutive week. Scalpel periodontal flap surgery

was performed in the upper quadrant under local infiltration of 2% lignocaine. Continuous sling sutures were placed. According to visual analogue scale, score 0 was given for laser site and score 1 for conventional scalpel site. There was less or no bleeding in the laser site when compared to conventional surgical site. It was calculated based on

the cotton gauzes used during surgery. Clinical observations of the surgical sites were recorded after 1st day, 12th day, 1 month and 3 months post-operatively [Figure 5, 6, & 7]. Three months post-operative probing pocket was around 3-4mm in both the surgical sites.

Table 1: Showing a comparison chart between laser vs scalpel periodontal surgery

Clinical Findings	Laser	Scalpel
Incision	No	Yes
Re-contouring	Yes	No
Local anesthesia	No/Little	Yes
Hemostasis	Yes	No
Operative pain	Nil/Mild	Mild
Post-operative pain/sensitivity	Nil	Mild/Moderate
Fast healing	Yes	Yes

DISCUSSION

Recently, advancements in LASER, the acronym of 'light amplification by stimulated emission of radiation' have shown a beneficial effect in the surgical field of periodontology. In this case series we found a better operative and post-operative clinical findings in the laser assisted surgical site. The drastic reduction in gingival inflammation after SRP shows the importance of mechanical plaque control measures before periodontal flap surgery as shown in a study by Antczak-Bouckoms et al.^[3]

In a five year retrospective study by Edward R. Kusek et al^[4], 80% of the pockets treated using the diode laser were restored to a healthy pocket depth of 3 mm. These results suggest that this treatment modality should become an adjunct for treating periodontal infections. Lobo and Pol et al^[5] in their study have concluded that the use of the diode laser for open flap debridement did not significantly benefit the treatment outcome on the whole. Short term benefit of reduction in gingival inflammation could potentially benefit the outcomes in diseased soft tissues with a larger inflammatory component.



Figure 1: Baseline



Figure.3: Pre-operative OPG.



Figure 2: After scaling and root planning.



Figure.4: Laser Application



Figure 5: 12th Post-operative day in the Laser side



Figure.6: Conventional Flap elevation



Figure 7: 12th Post-operative day in the Conventional side

In addition to their surgical applications, low-level lasers such as Er:YAG laser irradiation promotes osteoblast proliferation showing higher and favorable tissue regeneration. These findings suggest faster bone tissue healing following periodontal and peri-implant low level laser therapy.^[6] Other clinical implications of diode lasers include bacterial elimination, pulpotomy, root canal disinfection, sulcular debridement, caries removal, aphthous ulcer treatment, analgesia, melanin pigment removal and treatment of dentine hypersensitivity.^[7] A review paper by the American Academy of Periodontology states that current evidence suggests that use of the Nd:YAG or Er:YAG wavelengths for the treatment of chronic periodontitis may be equivalent to scaling

with respect to a reduction in subgingival bacterial populations.^[8] The ErCr:YSGG laser has gained recent popularity and some claim that it can be used for laser cutting, shaving, contouring and resection of oral osseous tissues. However, there is no evidence to suggest this technique is superior to conventional osseous surgical methods. In our case series we used conventional scalped method to treat angular defects.^[8] Romanos and Nentwig^[9] suggested that laser treatment results in minimal or no post-operative swelling, bleeding, scar tissue formation or pain (lasers have a welding effect on nerve fibers). We also noted similar findings in our case series.

CONCLUSION

Though we found appreciable patient comfort while using lasers for periodontal surgery, the post-operative results were almost same in both the surgical sites. Further research should be focused based on our analysis with larger sample of patients for an evidence based surgical approach.

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