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Laser curettage -a novel approach in treatment of chronic inflammatory gingival enlargement - A case series ¹Dr. Lalitha Shiggoan, Reader, Department of Periodontics and Implantology, ACPM Dental College, Dhule, Maharashtra ²Dr. Gunderao Kulkarni, Post graduate student Department of Periodontics and Implantology, ACPM Dental College Dhule, Maharashtra

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Abstract

Gingival enlargement is one of common feature of chronic inflammatory gingivitis and periodontitis. Various Nonsurgical and surgical treatment modalities have been incorporated in treatment of gingival enlargement. Laser shows promising results as it is minimally invasive procedure and used to treat gingival and periodontal condition like pocket infections ,PDT, Photobiomodulation, sulcular debridement and LNAP. Presented case series to evaluate efficacy of diode laser curettage in treatment of chronic inflammatory gingival enlargement.

Material method: Total four patients diagnosed with chronic inflammatory gingival enlargement were treated .Gingival enlargement index (GEI), plaque index (PI), gingival bleeding index (GBI), probing depth (PD), clinical attachment level (CAL), gingival margin level (GML) were recorded at Base line and 3months. After SRP ,Laser curettage done using Diode laser Zolar photon plus 980nm with power setting at 1 watt.

Results: GI, PI, GBI showed statistically significant reduction; average probing depth in anterior at baseline was 7.4825 mm reduced to 3.100mm and in posterior value of 7.075mm reduced to 4.4mm which statically significant (p value <0.01). Average CAL gain in anterior teeth was 1.625mm (p -value 0.090*) while posterior teeth shown less CAL gain average 0.95mm(p value - 0.019*).Post-operative gingival recession were seen in all four cases average 1.0504mm after 3 months. Mean gingival enlargement of 30.25% was completely resolved at end of 3 months which was significant.

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Conclusion: Laser curettage will be minimally invasive treatment option for treating chronic inflammatory gingival enlargement with good aesthetic results.

Keywords: Inflammatory gingival enlargement, gingival enlargement, laser, curettage.

Introduction

Gingival enlargement, a terminology used for an increase in the size of the gingiva and one of the common of feature of gingival diseases. It is a multifactorial condition that develops in response to various stimuli like plaque– induced or associated with systemic and hormonal disturbances and interactions between the host and the environment. Inflammatory gingival enlargement is most common among all types of enlargements. There are two types of inflammatory enlargement acute and chronic in which chronic is more common.^[1,2]

Complete mechanical debridement considered as the "gold standard" before proceeding of any periodontal treatment Though scaling and root planing leads to resolution of mild gingival enlargement, complete elimination of inflammatory enlargement cannot be achieved, in cases like gingival enlargement of grade 2 and grade 3 severity .Situations in which the chronic inflammatory gingival enlargements include significant fibrotic components that do not respond to and undergo shrinkage post scaling and root planing are treated with surgical removal of the excess tissue.

Gingivectomy, flap technique (more than six teeth / if attachment loss and osseous defects) apically displaced flap and post treatment recall –maintenance program^[2] Conventional approaches have some disadvantages like delayed wound healing, post-operative pain, and difficulty in performing procedure in severe enlargement cases and severe gingival recession.^[3]

Lasers, when used for various soft-tissue procedures, can provide distinct advantages over the traditional scalpel, Such as easy ablation of small volumes of tissue, hemostasis which, in turn, offers better visualization of the surgical field ,sterilization of the incision or target surface area and less post-treatment tissue edema and swelling that laser periodontal therapy may have the beneficial side-effect of reducing inflammatory mediators, such as interleukin-1b , interleukin-6 , tumor necrosis factor-a and matrix metal protease,loproteinase-8^{[3][4][5]}

For many procedures use of the laser can be considered a minimally invasive technique, resulting in less discomfort than traditional approaches ^[5].Laser procedure as minimally invasive technique are used to treat gingival and periodontal condition like pocket infections ,PDT, Photobiomodulation, sulcular debridement and LNAP ^[7].When laser curettage is done in the pockets, the ablating action of the laser, removes the epithelium lining the soft tissue walls of the pocket and the adjacent inflammatory cell infiltrates^{[8][9]} The low dose radiation that scatters into the surrounding tissues possess the beneficial effects on the healing process.^[10]

Considering advantages of diode laser, series of cases were treated to evaluate efficacy of diode laser curettage in treatment of chronic inflammatory gingival enlargement **Material Method**

Total of four, two female and two male patients were age range of 35-51 years reported to the department of periodontics who had chief complain of swollen gums and bleeding on brushing .Medical history was not significant, no history of any drug intake .On examination presence of local factors, generalized bleeding on probing, periodontal pockets were present with clinical attachment loss, grade I and grade II mobility, severe gingival enlargement was seen. One patient showed pathologic migration with 11.

Radiographic investigation:

All patients on radiographic investigation Orthopantmograph revealed horizontal bone loss.

Clinical diagnosis

All four cases were diagnosed with of generalized chronic periodontitis with inflammatory gingival enlargement was made. Gingival enlargement index (GEI), plaque index (PI), gingival bleeding index (GBI), probing depth (PD), clinical attachment level (CAL), gingival margin level (GML) were recorded at base line and 3months. (In Table 1 to 8) .All measurements were recorded with help of stent using UNC -15 periodontal probe.

Treatment

Treatment plan included was phase I therapy, after 4 weeks of follow up, unresolved gingival enlargement and periodontal pockets(fig 1,9,12,15) were further treated with laser curettage plus SRP (scaling and root planing). Each patient was treated with SRP and laser curettage with average 6 teeth in each treated arch.

Laser curettage using Diode laser (Zolar photon plus 980nm) with power setting at 1 watt, continuous initiated contact mode was used(fig 4). Following initiation, the tip was inserted 1 mm below gingival margin and the sulcus epithelium was removed using a continuous curetting motion against the soft-tissue wall (30-45 seconds) (fig5,6).Following the laser curettage, the roots were scaled and root planed until smooth. The pockets were rinsed with saline. Patient. Post-operative analgesic were prescribed. Patients were recalled after 7 days and 3 months (fig 7).All four patient did not report any post-operative swelling. (fig 8)

Results

Four patients; two male two females were included with mean age of 43 ± 8 years. Each quadrant was assessed with all above mentioned clinical parameters. There was clinical and statically significant difference seen in all four patients (p vale<0.005) (table10)

Statistical analysis was done using IBM SPSS 20 software using Paired t test .Plaque score [Silness & Loe (1964)] at baseline ranging from 2.1-2.6(mean-2.362) after 3months it was reduced to 0.85-1.25 (mean-1.16) which was statically significant (p-0.01*)(table 10)

Gingival index score (Loe and Silness -1963) at baseline with rage of 1.8 to 2.6 (mean-2.025) which was reduced to 0.7 to 1.93 (mean-1.3275) showing mean difference of 0.689 (p vale -0.002^*) (table 10)

Gingival bleeding score ranging 60% to 97.8% (mean-82.325) at baseline reduced to 19.45% -33.78% after 3 months (mean-26.89%) with mean difference of 55.49%. (p value< 0.002) which was statistically significant . (Table 10)

Reduction in probing pocket depth was found more in anterior teeth as compare to posterior teeth. In anterior teeth average probing depth at baseline was 7.4825mm reduced to 3.100mm after 3 months which statically significant (p value 0.01). While in posterior teeth at baseline with mean value of 7.075mm reduced to 4.4mm after 3months which was significant (p value <0.001) (table 10)

Average CAL gain in anterior teeth was 1.625mm (p - value 0.090*) while posterior teeth shown less CAL gain average 0.95mm(p value -0.019*) (table 9).Post-operative gingival recession were seen in all four cases average 1.0504mm after 3 months which was initial 0.4899mm (Table-10)

Study cast for gingival enlargement index assessment King GN et al (1993)^[11] gingival enlargement index was employed. Case I, II, III and IV showed following gingival index values at baseline were 20%, 23%, 36% and 42% (table 4) and mean gingival enlargement of 30.25% which was completely resolved at 3 months follow up.

Discussion

Main objective of treatment of chronic inflammatory enlargement are to restore aesthetics, eliminate

periodontal pockets and gingival contour for good plaque control. The present case series evaluated the clinical efficacy of diode laser curettage in treatment of chronic inflammatory gingival enlargement patients and showed that definitive reduction in enlargement, probing depth, gingival inflammation and restoring gingival contours The glocad approach therepies like SPD laser

The closed approach therapies like SRP, lasercurettage/SRP, and laser-curettage/SRP/laser-sealing resulted in less gingival recession than the open approach (papilla reflection/flap closure). If aesthetics are a concern, laser-curettage is a viable options^{[12][13].}

The mean probing depth reduction was 4.3mm in anterior sextant and for posterior sextant was 2.4mm. The mean CAL gain at 3 months was 1.67mm for anterior and for posterior was 1.0mm. GML was observed in anterior than posterior sextants of 1.35 mm, the following results are in accordance with studies^[14]Zaffe D et al ^{[15],} White JM et al ^{[16],} Neiburger EJ ^[17]

According to case report by Tupili Muralikrishna laser assisted periodontal management of drug induced gingival overgrowth under general anaesthesia was viable option.^[18] In our case report laser curettage was minimally invasive procedure, lead to better visualization of site for effective root surface debridement ^[5], gingival laser curettage was effective by reducing thickness of tissue by ablation and increase patient acceptance. These results were in accordance with Aoki A, ^[19]Israel M,et al ^[20]

A Literature review done by Cobb C^{[13][14]} mentioned that laser induced wound shows decreased tendency towards scar contraction compared to traditional scalpel surgeries. This might be one reason to see less recession seen after lase curettage having advantage for aesthetics .There is substantial clinical benefit from laser-mediated subgingival curettage and lasers used as a monotherapy or adjunctive to scaling and root planing produce a significant reduction in sub gingival bacterial loads. According to systematic review the results of laser therapy in treatment of periodontitis are not convincible because of the following reason like heterogeneity in studies AAP 2002^[21]

Images

Case 1



Figure 1: Pre-operative



Figure 2: POST SRP



Figure 3: Pocket Measurments



Figure 4: Aramamenterium Diode Laser



Figure 5: Laser Tip Insertion



Figure 6: Laser Curattage



Figure 7: Post Laser Curattage



Figure 8: 3 Months Follow UP



Figure 9 : 1 year follow up



Figure 9 a: 1Year follow up

Case 2



Figure 10: Preoperative



Figure 11: After SRP



Figure 11 a: After Laser Curattage Case: 3



Figure 12: Preoperative



Figure 13: POST SRP



Figure 14: Post Laser Curattage

Case 4



Figure 15: Pre-Operative



Figure 16: Post Laser Curattage

Table 1: Plaque index

No. of patient	Baseline	3 months
Case 1	2.1	0.85
Case 2	2.3	0.93
Case 3	2.45	1.25
Case 4	2.6	1.63

Table 2: Gingival index

No. of patient	Baseline	3 months
Case 1	1.25	0.7
Case 2	1.8	0.93
Case 3	2.45	1.75
Case 4	2.6	1.93

Table 3: Gingival bleeding index scores

No. of patient	Baseline	3 months
Case 1	60%	19.45 %
Case 2	76%	23 %
Case 3	95.5%	31.33%
Case 4	97.8%	33.78%

Table 4: King GN et al (1993) gingival enlargement index

No. of patients	Baseline
Case I	20%
Case II	23 %
Case III	36%
Case IV	42%

Table 5: Probing depth for anterior sextant

No. of patient	Baseline in mm	3 months in mm
Case 1	7.23	4.0
Case 2	6.5	3.3
Case 3	6.8	2.1
Case 4	9.4	3.0

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Table 6: Probing depth for posterior sextant

No. of patient	Baseline in mm	3 months in mm
Case 1	7.3	4.4
Case 2	5.4	3.0
Case 3	8.0	5.2
Case 4	7.6	5.0

Table 7: Clinical attachment level for anterior sextant

No. of patient	Baseline in mm	3 months in mm
Case 1	7.5	6.0
Case 2	6.5	6.0
Case 3	5.5	2.0
Case 4	6.0	5.0

Table 8: Clinical attachment level for posterior sextant

No. of patient	Baseline in mm	3 months in mm
Case 1	5.6	4.4
Case 2	4.4	3.0
Case 3	6.0	5.4
Case 4	5.6	5.0

Table 9: Recession with anterior sextant

No. of patient	Baseline in mm	3 months in mm
Case 1	1.0	2.4
Case 2	0.0	1.4
Case 3	0.0	0.0
Case 4	0.6	2.0

Table 10

Variable	Interval	Ν	Mean	Std. Deviation	Difference	p value
DI	Baseline	4	2.3625	0.21360	1 109	0.001*
11	3 months	4	1.1650	0.35492	1.190	0.001
GI	Baseline	4	2.0250	0.62249	0.698	0.002*
01	3 months	4	1.3275	0.60368	0.098	0.002
CDI	Baseline	4	82.325	17.8089	55 /35	0.002*
ODI	3 months	4	26.8900	6.77425		0.002
PD_AS	Baseline	4	7.4825	1.31297	1 3825	0.01*
	3 months	4	3.100	0.7874		0.01
PD_PS	Baseline	4	7.075	1.1529	2.675	0.001*
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	3 months	4	4.400	0.9933		
CAL_AS	Baseline	4	6.375	0.8539	1.625	0.090*
	3 months	4	4.75	1.893		
CAL_PS	Baseline	4	5.400	0.6928	0.95	0.019*
	3 months	4	4.450	1.0504		
Recession	Baseline	4	.400	0.4899	-1.05	0.050*
	3 months	4	1.450	1.0504		

Conclusions

For residual gingival enlargement after SRP, treatment options will be gingivectomy or periodontal flap with internal bevel usually leads to significant recession post operatively. Laser curettage can be considered as minimally invasive procedure with good aesthetic results as compared to traditional treatment of gingival enlargement. Laser curettage can be viable option in the treatment of chronic inflammatory gingival enlargement.

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