

## TREATMENT OF ORTHODONTICALLY INDUCED GINGIVAL HYPERPLASIA BY DIODE LASER - CASE REPORT

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### Abstract:

It is well known that excessive gingival display in the anterior region can have a very negative impact on the patients smile and psychology. This excessive gingival display could be due to gingival enlargement or altered passive eruption of the teeth. These defects can be corrected through periodontal surgeries. This case report describes successful aesthetic crown lengthening in maxillary and mandibular anterior teeth using diode laser.

Keywords : anterior crown lengthening, diode laser, gingivectomy, gingivoplasty

### Introduction :

Esthetics of the anterior maxillary region of the mouth is mainly determined by the appearance of the gingival tissues surrounding the teeth. Symmetry and contour of gingival tissues can significantly affect the harmonious appearance of the natural or prosthetic dentition. Nowadays, patients have a greater desire for more aesthetic results which may influence treatment choice. Healthy and inflammation-free periodontal tissues provide an ideal anterior appearance.

One of the most common soft tissue problems associated with fixed orthodontic appliances is gingival enlargement or hyperplasia. The prevalence rate of 10% is reported.<sup>1</sup>Maintaince of oral hygiene gets impeded when there is gingival enlargement due to orthodontic appliance. It also interferes with occlusion, mastication, phonetics and in most cases may cause aesthetic and

psychological problems and has been reported to compromise orthodontic tooth movement<sup>2</sup>. Gingival hyperplasia (of inflammatory origin) affecting orthodontic patients can be localized or

generalized gingival tissue growth, starting at the interdental papillae 1 to 2 months into treatment<sup>3,4</sup>.

The first line of treatment in the management of gingival enlargement is patient motivation to maintain oral hygiene with adjunctive use of mouth rinses. This relies on patient compliance; that it can be inadequate with limited success in some patients<sup>5</sup>. Nonsurgical periodontal treatment (including oral hygiene instructions, scaling, root planing, and prophylaxis) is the conventional management approach for gingival enlargement but is not always effective when gingival enlargement is extensive and self-care is compromised<sup>6</sup>.

This has led to surgical approach for management of gingival enlargement. But surgical treatment is considered to be invasive and may not be effective if self-care oral hygiene practices remain poor<sup>7</sup>. In the recent decades lasers have gained considerable attention with advantages of superior hemostasis less postoperative discomfort, pain or oedema, better tolerance from the patient, less complicated procedures, suturing and dressing avoided, decrease chances of postoperative bacteraemia, better visibility and accessibility<sup>6</sup>.

This is a case report evaluating the effectiveness of diode

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laser gingivectomy as an adjunct measure in orthodontic patients.

Case History :

The aim of this case report was to evaluate the effectiveness of diode laser gingivectomy as an adjunct to nonsurgical periodontal treatment in a subject undergoing fixed orthodontic appliance treatment and persistent gingival enlargement.

Materials and Methods :

This case was treated at the department of Periodontics, A.B.Shetty memorial institute of dental sciences, Deralakatte, Mangalore after approval of the University Ethics Committee. Patient was first briefed about the treatment procedure and written consent was obtained.

Patient was undergoing fixed orthodontic appliance therapy that had received ongoing nonsurgical periodontal treatment and instructions on oral hygiene but had persistent gingival enlargement. Patient was a 22 year old female, healthy non smoking who displayed gingival enlargement on the labial side of the anterior teeth. Patient was not medically compromised or taking medications that may cause drug associated gingival enlargement. Patient was not currently pregnant or lactating.

Initial therapy was performed consisting of full mouth scaling and root planing, by hand and ultrasonic instrumentation, and oral hygiene instructions were given.(fig 1) Even after the initial therapy the gingival enlargement persisted. Patient was advised diode laser gingivectomy ( 810 nm) as an adjunct to nonsurgical periodontal treatment on sites with gingival enlargement. The diode laser gingivectomy was performed under topical lignocaine anaesthetic gel, applied for 3 minutes prior to operation. The gingivectomy was performed with gentle, sweeping brush strokes with a power output of 1.2 W, continuous wave (CW) using the laser fibre tip (400 µm in diameter).gingivectomy and gingivoplasty of upper and lower anterior teeth was carried out. Ablation was performed using light brushing strokes and the tip was kept



Pre Operative Fig 1



Post Operative Fig 2



Post Operative After Four Months Fig 3

in continuous motion. Remnants of the ablated tissue were removed using sterile gauze dampened with saline. Gingivoplasty was done in the interdental papilla and marginal gingival to create a normal physiological contour by changing the tip angulations. This procedure was done until the desired architecture of marginal gingival was achieved.(Fig 2) High-volume suction was used to evacuate the laser plume and charred odour. Haemostasis was checked. Safety glasses were worn by the operator; patient and assistant. Any instrument with mirrored surface was avoided to avoid reflection of the laser beam to other

tissue surfaces. Patients were given postoperative instructions. For pain control, divon plus (500-mg tablet) was prescribed to patient if needed. Patient was followed up after 1, and 3 weeks post operatively. It was found that there was no bleeding immediately post operatively or in the follow up period. Patient did not require any analgesic in the post operative period. But Wound healing was slightly delayed. Patient was recalled every month for check up, no regrowth was noticed. Healing was satisfactory. (Fig 3)

#### Discussion :

Lasers are being used in many fields and settings in dentistry due to its clinical efficacy. Orthodontic treatment primarily causes marginal gingival inflammation and secondary to that causes hypertrophic gingival margins. Laser has multiple advantages and hence is a good option for the treatment of hypertrophic gingival margins.<sup>8</sup>

This case report suggests that nonsurgical periodontal treatment with the adjunct use of laser therapy can be effective in the management of gingival health problems in patients with fixed orthodontic appliances.

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The results of this case report confirms the findings of previous studies that the use of laser can quickly resolve gingival overgrowth.<sup>9,10,11,12</sup> In addition, the adjunct use of diode laser gingivectomy was more effective in controlling gingival inflammation than nonsurgical periodontal treatment alone.

Most of the times the gingival hypertrophy in orthodontic patients is iatrogenic mainly because the long time of the treatment. The treatment protocol for such gingival over growth is careful training in oral hygiene along with surgical technique. The proper use of a soft tissue laser in orthodontic patients can improve the quality of results, decrease treatment time and reduce appointments. Laser treatment can be completed quickly, painlessly, and infection free with minimal side effects to the patients.

Based on the case report, it can be concluded that diode laser gingivectomy can be a valuable tool for obtaining quicker and greater improvement in gingival health, suggesting its beneficial use for orthodontic patients with gingival overgrowth especially when oral hygiene is not sufficient to achieve normal healthy gum.