

# Diode Laser Assisted Excision of Gingival Fibroma: A Case Report

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### Abstract

Fibroma is a common benign tumor. It can occur at any age from almost any soft tissue site; the tongue, gingiva, and buccal mucosa being the most common. Females are twice as likely to develop this benign tumour in compared to male. Typically the lesion is a rounded, well-demarcated, variably sized mass attached to tissue by a stalk. The surface is smooth, and the colour is slightly pale than the adjacent healthy tissue. It is usually characterized by a slow, painless growth accumulated over a period of months or years. Treatment usually requires total excision and recurrence is rare. This case report describes the use of diode laser on the excision of gingival fibroma. The excision of fibroma using the diode laser was a quick clinical procedure without bleeding. During the post-operative days, the patient reported no pain or discomfort. The wound healing of the soft tissue was satisfactory and no scarring could be seen in the region of the surgery. The excision of the fibroma with the diode laser is a safe, quick procedure, with minimum post-operative discomfort and complications.

**Keywords:** Diode laser, Fibroma, Gingival enlargement, Hyperplastic lesion

### INTRODUCTION

Fibromas are considered the most common benign soft tissue growth in the oral cavity.<sup>1,2</sup> They may arise from the gingival connective tissue or from the periodontal ligament. They are slow-growing, spherical tumours that tend to be firm and nodular but may be soft and vascular.<sup>3</sup> This lesion has a predilection for females, occurs in patients older than 30 years. Usually it is a few centimetres in diameter, pedunculated or sessile, and occurs frequently on the gingiva or buccal mucosa. The term, "focal fibrous hyperplasia" as suggested by Daley et al.1990<sup>4</sup> implies a reactive tissue response which is preferable to the term, "fibroma." It incorrectly implies, a benign neoplastic proliferative fibrous connective tissue.<sup>5</sup> The lesion presents as painless, sessile, round or ovoid, broad-based swelling, lighter in colour than surrounding tissue due to a reduced vascularity.<sup>6</sup> The surface may be ulcerated and diameter varies from 1 millimetre to several centimetres. Treatment of the fibroma involves surgical excision, and recurrences are very infrequent. Irritational fibroma, or traumatic fibroma, is a common sub mucosal response to trauma from teeth or dental prostheses and was first reported in 1846<sup>7</sup> as fibrous polyp and polypus.

There are different kinds of treatment for these hyperplastic tissues such as scalpel excision, surgery using electro cautery and laser surgery. Conventional surgery could be followed by several complications such as intraoperative bleeding, difficulties in

wound healing and maintenance of sterility during surgery.<sup>8,9,10</sup>

Diode lasers have been used in a variety of soft tissue surgical procedures and have many advantages such as less pain, bleeding, scar formation and infection. Histologically, laser wounds have been found to contain a significantly lower number of myofibroblasts. This results in less wound contracture or scarring, and ultimately improved healing.<sup>11</sup>

As a result of improved healing and haemostasis, intraoral laser wounds can often be left without sutures, healing by secondary intention except when cosmetic is a concern. Less postoperative swelling and pain is another advantage of lasers which most likely correlates with decreased tissue trauma and an alteration of neural transmission.<sup>11</sup>

### CASE REPORT

A 40 years old male patient reported to the Department of Periodontology, Kalinga Institute of Dental Sciences, Bhubaneswar with a complaint of growth in the gums, in

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the upper front teeth region, present since last 1.5 years. The patient was apparently all right 1.5 years back, and then he noticed a small growth in the maxillary anterior teeth region. The growth was gradual in onset, slowly progressing and with time had increased to present day size. It was associated with bleeding, but no associated pain was there. His past medical and dental histories were not significant. There were no contributory family and habit history.

On extra oral examination, the face appeared bilaterally symmetrical, with competent lips and the lymph nodes were not palpable. Intraoral examination revealed a solitary sessile growth present on the buccal keratinized gingiva in relation to 11 and 13 [Figure 1]. The lesion was round in shape and measured approximately 7 x 9 mm in size. Extended mesiodistally from mid-buccal aspect of 11 to mesial aspect of 12 and superior-inferiorly from mucogingival line in relation to 11, 12 to the apical third of the crown of 11. The lesion was reddish pink in colour and surface was lobulated [Figure 2]. There was no displacement and mobility of associated teeth due to the growth. On palpation, the growth was firm and tenderness was seen only on firm pressure but not on light palpation.

### Investigations

Intraoral periapical radiograph of the region revealed no significant bone loss with respect to 11, 12 [Figure 3]. Routine haematological examinations including hemogram, bleeding and clotting time were found to be within normal physiological limits.

### Treatment

Phase 1 therapy consisted of a thorough scaling and root planing and oral hygiene instructions were given. The patient was demonstrated the proper brushing technique (Modified Bass Technique). Patient was advised to use 0.2% chlorhexidine mouthrinse 10 ml, 1:1 dilution, twice daily for 15 days. The patient was reviewed after 1 week and there was considerable reduction in the size of the growth.

After the treatment plan was explained, an informed consent was obtained from the patient. Phase II therapy consisted of the surgical excision of the growth and under local anaesthesia complete excision of the gingival growth was done utilizing a diode laser unit (Picasso, AMD laser technologies, USA; wavelength 810 nm). Laser parameters were 1.8 W at continuous mode [Figure 4]. The procedure was done in contact mode. Surgical assistant grasped the gingival growth with tissue pliers and retracted with minimum tension. The fiberoptic tip was placed at the periphery and gradually moving around the lesion, continuously firing the laser to dissect out the fibroma completely [Figure 5]. As there is a chance of thermal damage in case of laser excision, utmost care was taken to cut the gingival growth from its base so that it should free from any thermal artefact as well as the peri-incisional margin and the main tissue mass should remain intact. The incision was extended in antero-posterior direction separating the lesion. Care was taken not to come in contact with the maxilla avoiding any changes in the hard tissue [Figure 6]. Following the procedure, antibiotic and analgesic were prescribed to the patient. Then, the excised tissue [Figure 7] was immersed in a 10% formalin solution and sent for histopathological examination.

At 1 week post-operative, the surgical site had healed uneventfully [Figure 8]. The patient was kept on periodontal maintenance therapy and proper brushing technique and oral hygiene instructions were re-instated. There was no recurrence of the lesion seen on 6 months recall post-operatively [Figure 9].

### Histopathological Examination

Histopathological examination revealed parakeratinized stratified squamous epithelial lining and the underlying connective tissue was dense fibrous in nature showing abundant collagen and few chronic inflammatory cells chiefly lymphocytes. Endothelial lined blood capillaries and extravagated RBCs were also seen [Figure 10]. Thus, a final diagnosis of gingival fibroma was given.



Figure 1: Pre-operative



Figure 2A & 2B: Pre-operative measurements

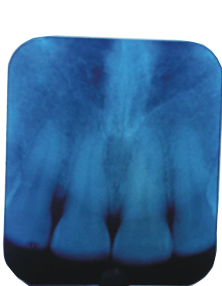


Figure 3: IOPA

Figure 4: Used Diode laser

Figure 5: Laser assisted excision

Figure 6: Immediate Post-operative





Figure 7: Excised tissue

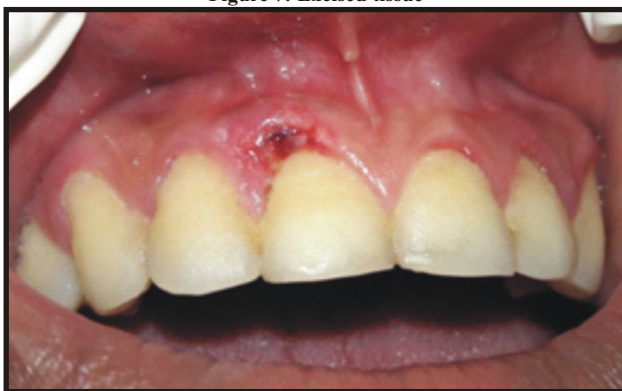


Figure 8: Post-operative after 1 week



Figure 9: Post-operative after 6 months

## DISCUSSION

The “inflammatory hyperplasia” is a non-specific term used to appreciate nodular growths of the oral mucosa that histologically shows inflamed granulation tissue.<sup>12,13,14</sup> Epulis is often referred to a similar lesion on the gingiva and size of these masses (hyperplastic) may be smaller or larger, which depend on components of inflammatory reaction and response of healing are overemphasized in particular lesion.<sup>12,15</sup> Reactive lesions are tumor-like hyperplasia and show a response to a low-grade irritation or injury, such as chewing, food impaction, calculus, iatrogenic injuries like broken teeth, overhanging dental restorations, and extended flanges of the denture.<sup>16,17</sup> Traumatic or irritational fibroma is a common, benign, exophytic and reactive oral lesion that develops secondary to injury and constitutes about 7.4% of oral soft-tissue lesions.<sup>18,19</sup>

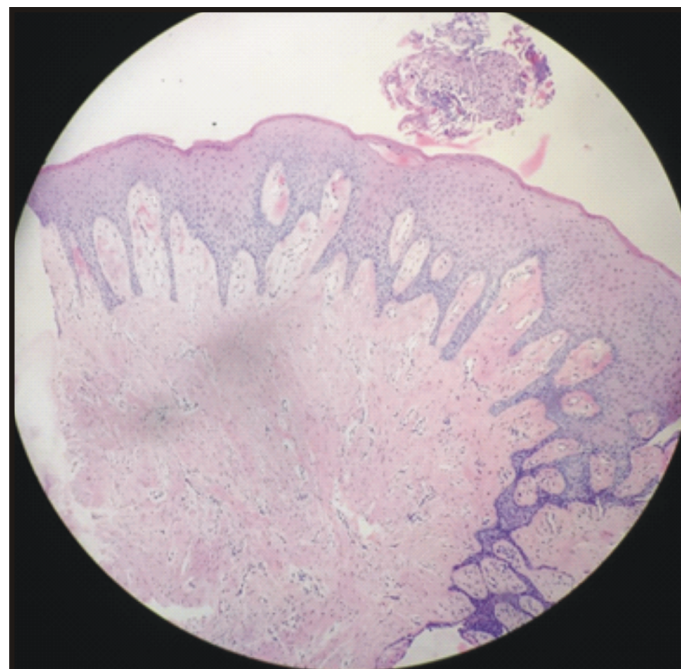


Figure 10: Histopathological picture

Campos and Gomez<sup>20</sup> and Weathers and Campbell<sup>21</sup> suggested that the stellate and multinucleate cells of giant-cell fibroma have a fibroblast phenotype and are large atypical fibroblasts. A variety of cutaneous lesions such as the fibrous papule of the nose, unguis fibroma, acral fibrokeratoma, and acral angiofibroma containing similar stellate mono- and multinuclear giant cells have been described in humans. The main similarity between this group of cutaneous lesions and the giant-cell fibroma is their histologic appearance. Irritational fibroma is also known as focal fibrous hyperplasia, oral fibroma, or fibromatosis fibroma. It shows female predilection than males and seen more frequently in the third and fourth decade of life.<sup>22</sup> approximately 60% of irritation fibromas involve the maxilla and more often found in the anterior region, with 55–60% present at the incisor-cuspid region.<sup>23</sup>

Clinical features comprise of sessile or pedunculated masses with smooth or injured surfaces, and are seen in different colours ranging from pale to bright pink to red.<sup>24,25</sup> The size of these reactive hyperplastic masses can be greater or lesser, depending on the components of the inflammatory reaction and healing response exaggerated in the particular lesion.<sup>12,15</sup> The frequency of irritational fibromas is found to be more in maxilla than the mandible and more often in incisor-cuspid region, ranging between 55% and 62%.<sup>23</sup> In our case, lesion was present in relation to 11, 12, and 13 tooth region. Diameter of these lesions measures <1.5 cm usually and more than 3 cm in rare cases. In a very few cases, lesions having a size between 6 and 9 cm have also been reported. Most of them are asymptomatic, only few are associated with bleeding. The surface of the lesion may be ulcerated in 66% of cases and intact in 34% of cases.<sup>26</sup> Irritational fibroma can also produce migration of teeth with destruction of

the interdental bone. Differential diagnosis includes PG, peripheral giant-cell granuloma, and peripheral ossifying fibroma (POF), which may also arise as a result of irritation due to plaque microorganisms and other local irritants.<sup>27</sup>

Histopathologically, fibroma can appear as an intact or ulcerated keratinized stratified squamous epithelial lining along with presence of chronic inflammatory cells. Treatment of fibroma consists of elimination of etiological factors, scaling of adjacent teeth, and total aggressive surgical excision along with involved periodontal ligament and periosteum to minimize the possibility of recurrence. Any identifiable irritant such as an ill-fitting dental appliance and rough restoration should be removed.<sup>22</sup>

Diode laser radiation is an excellent, simple, and safe form of treatment of oral lesions. This procedure is virtually bloodless, postoperative edema and discomforts are minimal. With laser irradiation, there is less damage to adjacent tissues and better visibility. Compared to conventional methods, laser surgery is less time consuming, less painful, more precise in the treatment of soft tissue lesions, produces less scar-tissue contraction, and maintains the elastic tissue properties.<sup>28</sup> In the above mentioned case, patient was satisfied with laser surgery since it was a painless procedure both intra and postoperatively. The mechanisms of diode laser that lead to ablation or decomposition of biological materials are photochemical, thermal, or plasma mediated.<sup>29</sup> The diode laser has been approved by the Food and Drug Administration for virtually all the soft tissue procedures. These procedures include soft tissue curettage, incisions, pocket debridement, and ablative excisions.

Numerous treatment modalities have been employed for the treatment of gingival fibroma consisting of surgical excision, electrocautery, etc., depending upon the clinical and anatomic considerations. With the advent of lasers in dentistry, lasers like CO<sub>2</sub>, neodymium-doped yttrium aluminium garnet (Nd: YAG), and erbium-doped YAG (Er: YAG) have been used to treat a number of intraoral soft tissue lesions such as papilloma, pyogenic granuloma, haemangioma, etc.<sup>30</sup> The safety and efficacy of laser systems and especially diode laser is already evaluated for the treatment of facial pigmentation and vascular lesions, fibroma, excision of epulis fissuratum, and gingival hyperplasia.<sup>31</sup>

Dental lasers offer a number of clinical advantages (especially for soft tissues), including hemostasis (the sealing of local vasculature), the ability to seal nerve endings and lymphatic vessels, reduced postoperative pain and swelling (thus reducing the need for postoperative analgesics/narcotics), reduced bacterial counts, and a minimized need for sutures in most surgical procedures.<sup>32</sup>

Long-term post-operative follow-up is very important because of the high growth potential of an incompletely removed lesion. Recurrences are rare and may be caused by repetitive trauma at the same site. The lesion does not have a risk for malignancy.<sup>33</sup> It is reported that the recurrence rate in laser surgery varies between 7.7% and 38.1% depending on differences in the variety and condition of the laser beams, the follow up period and the race. Therefore, the regular follow up is obligatory after excision of the lesion.<sup>10</sup>

## CONCLUSION

Gingival fibroma can be of different types like irritational fibroma, pyogenic granuloma and peripheral giant-cell granuloma. Hence, proper histopathology investigation and radiographic evaluation are necessary for accurate and final diagnosis. In addition to this, an early detection and treatment of this reactive lesion by the dentist can reduce the chances of dentoalveolar complications. Case reports described here showed that diode laser treatment was highly effective. Easy handling of the fiberoptic tip combined with the properties of diode laser helped in obtaining a clean, thin and fast cut; often without bleeding or scarring. Because of the sterilizing and tissue growth stimulating properties of the laser, it was possible to obtain excellent healing in a few days, even without surgical suturing. So, it can be concluded that, awareness of the incidence and description of these kinds of lesions can help the clinicians to make a better diagnosis and offer optimal treatment.

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