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Case Report

Effectiveness of laser diode in removal of papillary gingival hyperplasia: A case report

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ABSTRACT:
Gingival hyperplasia has significant popularity in daily clinical examination in recent years. Without proper medical therapy may cause of alveolar bone resorption and varying degrees of tooth mobility. Conventional gingivectomy for treatment of gingival hyperplasia are using of scalpel and electrosurgery. Alternatively, other advanced procedures with a variety of lasers have been applied effectively. In this case report, a diode laser with wavelength of 810 nm was employed in papillary removal of a 29-year-old male patient who complained of a redness and swelling in the mandibular incisor gingiva. It was concluded that 810 nmdiode laser was an efficient choice for excision of gingival overgrowth with satisfying for both esthetic aspect and comfort of patient.
Keywords: diode laser, excision, gingival hyperplasia.

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INTRODUCTION

Gingival hyperplasia or enlargement is an abnormal situation in which the gingiva increase in the size. It can range from a minor hyperplasia of the interdental papillae to a growth in which the altered tissue completely cover the dental crowns remain.[1]Due to their varied appearance, the diagnosis of these entities is difficult for the clinician. They are classified according to their etiopathogenesis, location, size, and extent, *etc*.A differential diagnosis can be made based on current information and clinical experience. Occasionally, an excisional biopsy and/or histologic examination may be required for correctly diagnose the uncommon cases of gingival enlargement.[2] Many causes have been reported for gingival hyperplasia in which mostlyas a result of long-term irritation. Sources of irritation may vary including poor oral hygiene, plaque accumulation orsubgingival calculus, chronic ginivitis, smoking, loose-fitting dentures.[3,4] Other etiologic factors are blood dyscrasias and hormonal effectorsystemic disease such as acute leukemia.[5,6]

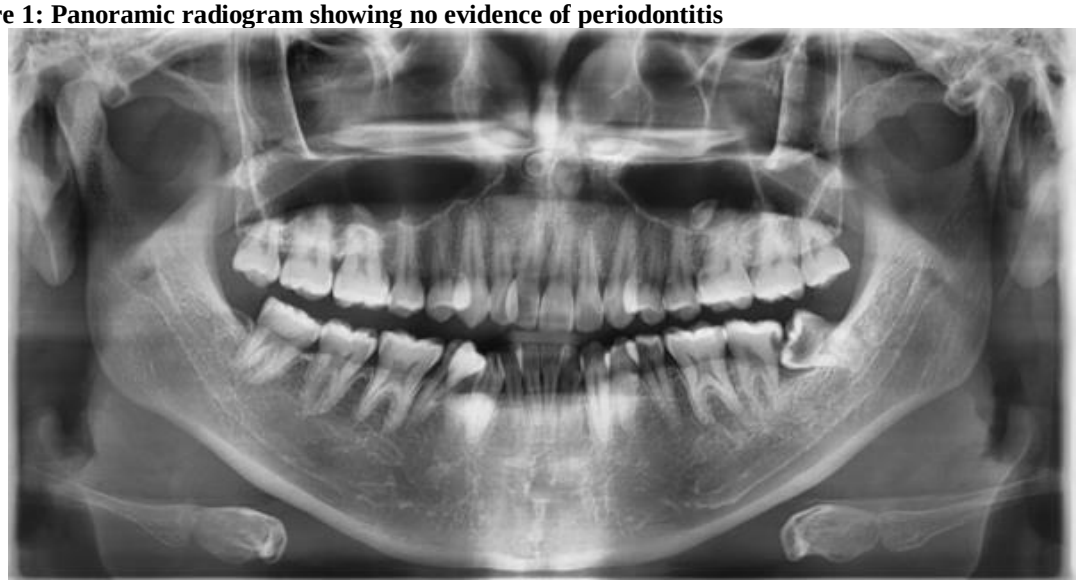
The treatment involves reduction of the causing factors and surgical for excision of lesion, if it does not respond to nonsurgical therapy, the causal factors persists and the tissue becomes more fibrous over time.[7]There are many surgical methods which may be applied for thehyperplastic tissue such as conventional scalpel excision, electrosurgery and recently laser surgical intervention.[5]Diode laser is approved bythe FDA as the most commonly laser used in oral surgical procedures.[8] Diode lasers are especially known like esthetic procedures with the effectiveness and safety in the excise of small exophytic lesions. Diode lasers achieve a significant advantages including better coagulation, no need to sutures,reduce posterior edema surgery and pain.[9]On histological examination post laser treatment, the lesions appear to be smaller in a few fibroblasts, resulting in a decrease in wound shrinkage, and significantly improved healing and scarring. Laser surgery has also been used successfully in the removal of the lesion with no repetition after 8-18 months.[10]

The aim of this case reportto show the least invasive treatment of reactive gingival hyperplasia using the AMD diode laser with 810nm wavelength and to evaluate the result of lesion photocoagulation as well as the obtainedesthetic.

CASE REPORT

A 29-year-old male patient was observed at the clinic because of redness and swelling in the mandibular incisor gingival papillae since past 10 months. The patientdid not have systemic diseases, drugs and smoke/alcohol assumption. The patient showed poor oralhygiene. The patient had misaligned teeth, especially the mandibular arch from 31 to 43. No evidence of periodontitis was observed by panoramic radiography (Figure 1).

Figure 1: Panoramic radiogram showing no evidence of periodontitis

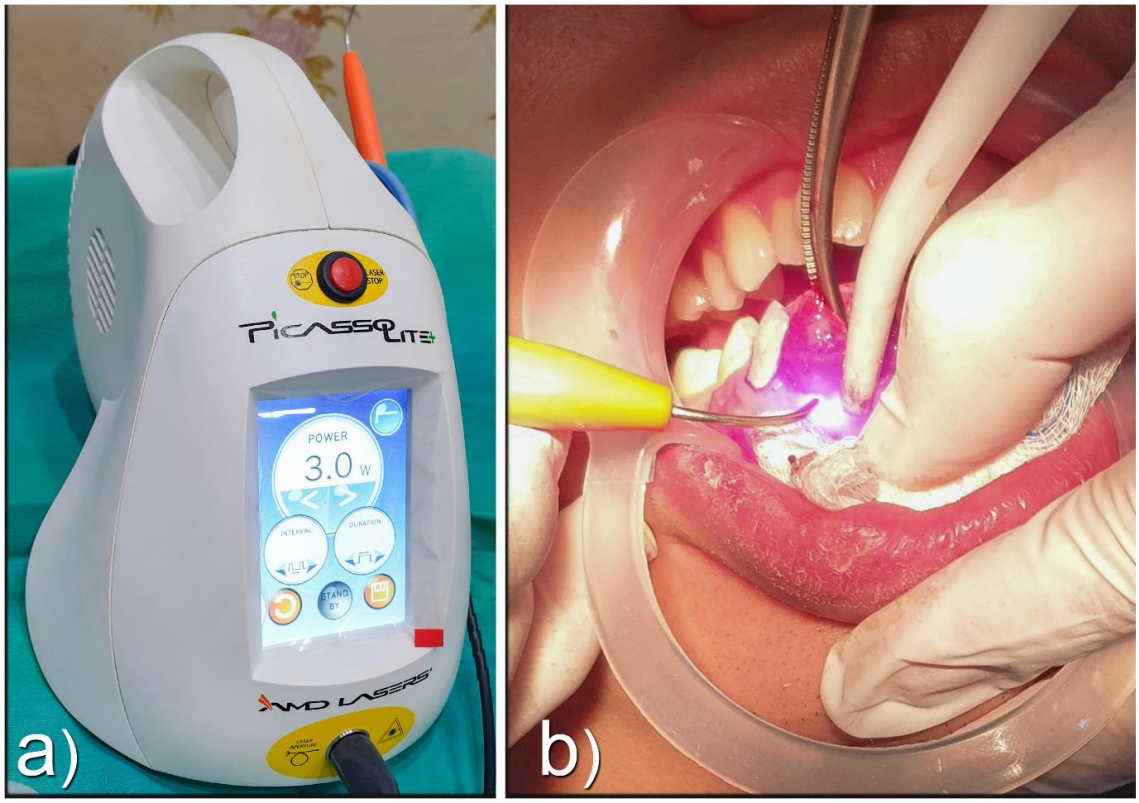


The intraoral examination showeda localized enlargement of the gingival tissues. Enlarge gum on labial side left lateral incisor mandibular measuring approximately 23 x 12 x 7 mm, reddish, un-stippling, fibrotic, well-defined and painless (Figure 2).

Figure 2: Patient before oral treatment

A diode laser of 810 nm wavelength (AMD laser®, Picasso Lite, USA) used at a power of 3.0 W, in continuous wave mode, with an optical fiber of 400 µm was performed to excise the hyperplastic lesion (Figure 3).

Figure 3: Diode laser settings image (a); Excision by diode laser tip (b)



Surgical procedure started with a contact topical anesthetics of lidocaine 10% spray and benzocaine gel 20% followed about 5 minutes later by the laser intervention.Immediate post-operative, no bleeding and no pain were recorded. The lesion was completely removed, clearly exposing the teeth of 31-43, preserving the labialfrenum and adjacent structures. The gingival papilla kept the anatomical shape (Figure 4).

Figure 4: Immediate post-operative

Neither postsurgeryanti-inflammatory nor analgesic medicationwas necessary taken. The patient was recommended to use oral antiseptics, like 0.12% chlorhexidinegluconate mouthwash twice a day for a week. The healing process was observed after one week, one month and three months (Figure 5).

Figure 5: One week post-operative (a); One month post-operative (b); Three months post-operative (c)

The almost complete healing process was observed after one month. Three months after surgical procedure, the marginal gingiva was homogeneity with the surrounding structure, no tissue contraction was found. The patient was comfortable without complications or functional disorders.

After resection, the biopsy specimen was transferred to formalin 10% solution and evaluated forhistopathology. The pathology anatomy results showed that the squamous epithelium hyperplasia formed epidermal bridges that invaded deep into the stroma. The basement membrane was clearly defined by limiting membranes. The underlying stroma was edematous, congested, infiltrated with many lymphocytes and plasma cells, and scattered with polymorphonuclear macrophages. The diagnosis of the lesion was accepted as "reactive gingival hyperplasia" (Figure 6).

Figure 6: Histopathological picture of lesion

DISCUSSION

Gingival enlargement can be multifactorial due to inflammation or fibrosis, or a combination of both.[8,11]Histopathological results revealed this papillary epithelial hyperplasia in response to a chronic inflammatory stimulus.[5,11,12]While the histological findings of fibromas are peripheral osteoblastoma or fibroma, giant cell, and pyogenic granuloma.[13] Theapplication of lasers for resection of oral hyperplastic lesions has various benefits such as reduced bleeding, making it more suitable for surgical treatment of oral mucosal lesions where there are many blood vessels as well as lower cost in comparison to other modern hard laser devices. Reducing swelling and post-operative pain are well observedfor laser treatments that correlated with reduced tissue trauma and neurotransmission alterations.[12,14]It was well documented that the lasers create local aseptic conditions leading to a reduction in sepsis. There is no need for sutures and guaranteed second-stage healing.

In this study, diode laser surgery exhibited effectively in the treatment of reactive papillary hyperplasia. With a flexible laser fiber tip can contact into position between two teeth to completely remove the lesion.So far, papillary gingival hyperplasia can be treated with a scalpel considered as a low cost therapy and longevity of instruments. However, they need constant and proper sterilization, the sharp edges also must be efficient to prevent further tissue damage and control of bleeding.[15,16]Another method as electrosurgery has been described but using it causes significant heat injury to nearby tissues and delayed wound healing.[17]Especially, such method is restricted to patients with pacemakers and already underwent radiotherapy.[15]As a result, this case report supports that diodelaser provides minimaldamage to the adjacent tissue, lead to reduced post-operative bleeding and excellent healing.

CONCLUSION

Papillary hyperplasia surgically removed by diode laser with only local anesthesia showed advantages and satisfactory results. By using the laser, the sutures were not required and the risk of bleeding and pain decreasedsignificantlydue to minimal intervention. The obtainedfinal esthetic result is more acceptable than the conventional gingivectomy.

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CONFLICT INTEREST

None.

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ETHICS APPROVAL

The study was approved by the Ethics Committee of Can Tho University of Medicine and Pharmacy (92/HĐĐĐ).

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