Efficacy of Diode Laser for Excision of Irritational Fibroma of the buccal mucosa: A Case Report  
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Abstract:  
Irritational Fibroma is a localised benign focal overgrowth affecting the oral cavity. It is a slow growing tumour of the soft tissue and may present as a single nodule or rarely multiple. The common modalities for the treatment of irritational fibroma include surgical excision, soft tissue Laser or Electro-surgery. Laser therapy is preferred over conventional surgical procedures as they are less painful to the patient; promote faster healing, with no complications and low recurrence rate. Laser ablation using diode lasers is one such well-accepted prophylactic treatment modality among clinicians. This paper represents a case of 30-year old female patient who was diagnosed with irritational fibroma on the left buccal mucosa and treated with Diode laser. The average power was set on 3 watts with wavelength 810 nm and irradiation mode was non-contact.  

Keywords: Irritational fibroma, Traumatic fibroma, Diode lasers, Fibro-epithelial hyperplasia, Fibrous polyp, Oral fibroma, Laser surgery, Laser tumour treatment.  

Introduction  
An irritational fibroma also known as traumatic fibroma or fibrous polyp in the mouth is a common, benign soft tissue tumour present as a local reactive focal overgrowth of mass which may or may not be symptomatic (1). It can occur at any age, though less in children, affect any sex, can be single or may appear multiple. Conventional surgical excision may be followed by some post-operative complications like bleeding, pain, oedema, scar formation & signs of recurrence. 

LASER, an acronym for, Light Amplification by Stimulated Emission of Radiation (2), is a new era scalpel which is non-invasive, painless therapy specifically designed for dentistry, marketed in the year 1989, has more than two dozen indications for use for oral procedures (3). This explains the unique qualities of LASER instrument & in turn, becomes the foundation for further elaboration of the uses of laser in dentistry. 

Each laser has its own specific characteristics, wavelength being most principle characteristic which defines the position of the laser in the electromagnetic spectrum. Laser tissue interaction is defined by the laser energy that enters the target tissue. Here the absorption of the laser beams energy plays an important role (4). For soft tissue excision where a sterile cut with as little bleeding as possible is required, 810nm diode lasers work well. 810 nm diode and CO2 lasers are very well suited for soft tissue excision. Caution is required when using Nd:YAG and 980 nm diode lasers because the higher thermal effect of these wavelengths (< 100µs) can very often cause necroses (3). 810 nm Diode lasers have a high affinity for melanin and less interaction with haemoglobin (2). Hence Diode Lasers have been used for the treatment of soft tissue lesions which have shown excellent results with minimal discomfort to the patient (5).This paper reports a case of irritational fibroma in a 30 year old female present over the buccal mucosa of left side at the level of occlusal plane.  

Case Report  
A 30 – year-old female patient reported to the Department of Oral Medicine, Diagnosis and Radiology of Y.M.T Dental College, Kharghar, with a chief complaint of painless growth on the buccal mucosa of left side of the mouth since 8-9 years and wanted to get that treated. Additionally, the patient reported history of cheek biting few years back due to which there was trauma and irritation on the mucosa and now the growth gradually increased in size but symptomless. The patient’s medical history was insignificant. Her family history, dental history and personal history were non-contributory and the review of her systems was normal.
Intra-oral examination revealed a small solitary exophytic pedunculated mucosal growth on the left buccal mucosa at the line of occlusal plane. It was ovoid, measuring 0.5cm x 1cm in diameter. The consistency was firm and non-compressible, mobile and non-tender on palpation. Hard tissue examination revealed sharp cusps in relation to both the upper and lower posterior teeth. Based on the clinical appearance, a provisional diagnosis of Irritational Fibroma of the left was made.

The patient was then referred for routine blood investigations. The blood reports were insignificant. The patient was scheduled for surgery using Diode Laser. The age of the patient, general health, size of the symptomless mass were the deciding factors for the choice of the treatment plan.

Laser ablation is considered to be a non invasive method for the treatment of soft tissue anomalies. The use of Diode lasers is indicated mostly for soft tissue lesions of approximate size of 3-4 mm³ that are selectively removed by minimal thermal changes to the adjacent tissues resulting in excellent homeostasis, minimal scarring, stimulate cellular activity and reduced operating chair time. Diode lasers also have an additional advantage of reducing post operative bleeding pain and oedema, hence only reduced intake of antibiotics is recommended after laser therapy. Laser therapy was recommended for our patient with 3 W powers at pulsed rate, with 810 nm wavelength. Protective eye wears were used to ensure safety for the patient as well as the dentist. The area was well isolated and adequate local anaesthesia was administered at the periphery of the mass. After local anaesthesia, the Diode Laser at a wavelength of 810 nm was selected for excision of the mass with an average power of 3W (recommended by the manufacturer). The entire mass was excised in a controlled fashion in non contact mode ensuring complete hemostasis. The procedure was painless and well tolerated by the patient. The patient was discharged immediately with post-operative instructions of topical application of Capsule Evion 400. Our case appeared as a multilocular radiolucency with expansion of buccal and lingual cortical plates resembling an ameloblastoma radiographically.

Over the years, various authors have attempted to classify and group the lesion owing to it's unique character. Praetorius (1981) proposed a classification for grouping CEOC as Type I (cystic type) & Type II (neoplastic type, dentinogenic ghost cell tumour). He further sub-divided the cystic patient (Type I) into 3 different types:

a) Simple unicystic type
b) Odontome- producing type, and
c) Ameloblastomatous proliferating type.[7]

The specimen was subjected to Histopathological examination. Microscopically, H & E stained slides showed hyperplastic parakeratinised stratified squamous epithelium proliferating into underlying connective tissue with arcading pattern, showing bundles of collagen fibres, fibroblasts, many dilated engorged blood vessels and chronic inflammatory cell infiltrate giving a definitive diagnosis of Fibro-epithelial Hyperplasia/ Fibro-epithelial Polyp (Irritational fibroma/ Traumatic fibroma).
Fig 4: Laser surgery.

Fig 5: Mucosal overgrowth excised.

Fig 6: After Laser Surgery.

Fig 7: Follow up after 3 days.

Fig 8: Follow up after 1 month.

Fig 9: Microscopic section (HE stained) of Irritational Fibroma
On the day of surgery, just after the excision of fibrous mass, the charred area was left at the area of concern to facilitate healing (Fig 6). On the 3rd day of follow up, the charring that was created by laser disappeared and signs of healing were seen (Fig 7). After 1 month of recall, complete healing was observed (Fig 8). The patient was followed-up 3 days after the surgery and then after 1 month post-operatively with no post-operative complications and a complete resolution of the area excised.

Discussion

Fibro-epithelial Hyperplasia (fibrous Polyp) also known as Irritation fibroma or Traumatic fibroma is a common benign nodular mass that histologically represents hyperplastic parakeratinized stratified squamous epithelium and fibrous connective tissue (1). It may or may not be symptomless. It is mainly due to chronic irritation such as cheek or lip biting, irritation from a sharp tooth, dentures or other dental prostheses (7). If painful, there might be presence of chronic biting, foreign bodies, sharp cusp, overhanging margins of restorations. They are benign and recurrences are mostly due to chronic irritation. Here in this case report, the occurrence of traumatic fibroma was due to sharp cusp present in relation to posterior teeth (25, 26, 35, and 36). Hence Enameloplasty was advised before Laser surgery in order to avoid any further recurrence.

In such cases where the slow growing mass is solitary, conventional surgical excision or Laser surgery are choices of treatment. Conventional surgery can cause pain, bleeding complications and scarring. Laser ablation, being a non-invasive method can be is indicated for most of the soft tissue lesions of small sizes and preserves the adjacent vital structures (6). Here in this case, after Laser therapy, the patient did not report any bleeding or pain.

Wound healing takes place by epithelialisation from the borders of the wound which takes around 3-4 weeks (6). Vitamin E capsule is a powerful antioxidant that plays an important role in re-epithelialization as well as protects the body from harmful free radicals (8). Alpha-tocopherol is the active component of vitamin E. In this case, patient was prescribed Vitamin E Capsule Evion for topical application, to accelerate the epithelialisation process and to boosts the immune system. Its antioxidant properties remove free radicals (dissolved in saliva) that damage the structure of cells and reduces cancer risk (8).

Conclusion

Laser therapy is considered to be superior to all the other treatment modalities due to its minimal post-operative complications (9). Laser ablation allows only selective removal of affected tissue thereby minimizing damage to adjacent vital tissues and leading to excellent wound healing and good functional results (5).

Reference

7. DelwynDyall-Smith, Oral irritated fibroma, DermNet New Zealand, all about the skin.

Conflict of interest: Nil
Source of fund: Self