

## Case Report

### **Treatment of pyogenic granuloma using a 940nm Diode laser**

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**Abstract:** Pyogenic Granuloma is a relatively common benign mucocutaneous lesion, as a response to either pregnancy, trauma, vascular malformation or chronic inflammation. Predominantly seen in the second decade of life in young females. The possible explanation maybe because of the vascular effects of female hormones. Most common intraoral site being marginal gingiva, followed by palate and buccal mucosa. Clinically the lesion manifests itself as an exophytic growth which may be lobulated or smooth, with either a pedunculated or a sessile base. The lesion may exhibit a pinkish red to purple hue which is often hemorrhagic. The clinical diagnosis of such lesions can be quite challenging because of its close resemblance to certain malignancies like peripheral giant cell granuloma, peripheral ossifying fibroma, peripheral odontogenic fibroma, hemangioma, Kaposi's sarcoma, bacillary angiomatosis, and non Hodgkin's lymphoma. The treatment options available are conventional surgical excision; electrocautery or lasers- erbium or diode. In this report, we seek to highlight the therapeutic advantages achieved with a soft tissue diode laser in the treatment of pyogenic granuloma.

**Keywords:** pyogenic granuloma, diode laser, soft tissue laser.

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#### **INTRODUCTION**

The earliest description of pyogenic granuloma in English literature dates back to 1844 which was given by Hüllihen[1]. Later in 1897, two French surgeons, Poncet and Dor, described and named this lesion as botromycosishominis. It has been referred to by a variety of other names such as granuloma pediculatum benignum, benign vascular tumor, pregnancy tumor, vascular epulis, Crocker and Hartzell's disease. It was given its present name by Crocker in 1903[2].

However, some researchers believe that the term "Pyogenic granuloma" or "granuloma pyogenicum" was introduced by Hartzell in 1904 that is widely used in the literature, although, it does not express accurately the clinical or histopathologic features.[3]

The term "hemangiomatic granuloma" was proposed by Angelopoulos AP that accurately expresses the histopathologic picture (hemangioma like) and the inflammatory nature (granuloma) of oral pyogenic granuloma[4]. Cawson et al. suggested that since the blood vessels are so numerous in oral pyogenic granuloma, alternative term for pyogenic granuloma is granuloma telangiectacticum[5] It usually arises in response to various stimuli such as lowgrade local

irritation[6,7], traumatic injury, hormonal factors[8], or certain kinds of drugs[9].

Treatment modalities include conservative surgical excision with the removal of the causative agents(plaque, calculus, foreign materials, or source of trauma), use of Nd:YAG laser[10], CO2 laser[11], flash lamp pulsed dye laser[12], cryosurgery[13], injection of absolute ethanol[14], application of sodium tetradecylsulfate(STS) sclerotherapy[15], intralesional injection ofcorticosteroids[16].

Apart from the above mentioned, diode lasers have proved beneficial in oral soft tissue surgical procedures[17]. This article reports the case of a 46year-old female patient with pyogenic granuloma successfully managed by a 940 nm diode laser.

#### **CASE REPORT**

A female patient aged 46 years came to the Department of Periodontics, Srinivas Institute of Dental Sciences, Mangalore, with a chief complaint of swelling on the gums in the right front region of the upper jaw since 6 months which was gradually increasing in size. The patient gave a history of slight pain and bleeding on brushing in the above mentioned area. No relevant medical history was recorded.

Clinical features- On intraoral examination, the growth was seen on the gingiva involving the interdental papilla in relation to the maxillary right lateral incisor and canine since 6 months which gradually increased in size and reached to the current size of approximately 1cmx 1cmx0.5cm. The growth appeared to be roughly oval in shape, smooth, sessile and exhibited bleeding on probing(Fig 1.). The oral hygiene status was fair.

After clinically diagnosing the lesion as pyogenic granuloma, the patient was explained about the various surgical options available and the patient preferred laser excision due to the advantages cited. An informed consent was obtained from the patient prior to the surgery after complete explanation of the procedure.

Surgical site was sterilised and patient was asked to rinse with 0.12% chlorhexidine mouthwash prior the surgical procedure. Local anaesthesia used was a lidocaine(15% w/w) topical aerosol.

All the laser safety precautions were taken like use of protective eyewear specific to the wavelength and minimizing reflective surfaces in the operating field to prevent potential hazard. The laser unit used for this procedure was 940nm Diode laser(epic10TM BIOLASE)(Fig 2). A 400µm initiated 7mm length disposable surgical tip with an output power of 1.2W, continuous wave mode with contact mode to excise the lesion(Fig 3). The treatment area was cooled by a continuous steady stream of saline. Post-operative instructions were given, analgesics(to be taken if required) and saline gargle was prescribed.

After excision the tissue was sent for histopathological analysis. The reports revealed that the tissue showed ulcerated epithelium, subepithelial lobules of capillaries with gross infiltration of mixed inflammatory cells, no evidence of dysplasia or malignancy which confirms the clinical diagnosis of pyogenic granuloma. (Fig 4) The patient expressed extreme comfort while the surgical procedure.



Fig-2: Laser unit -epic10TM BIOLASE



Fig-3:Post-operative

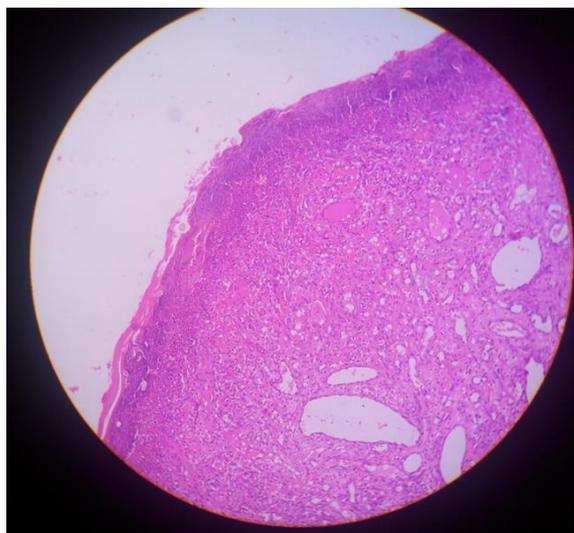


Fig-4: Histopathological picture



Fig-1: Pre-operative

#### DISCUSSION

Diode lasers have provided considerable benefit to dental patients and dentists[18, 19] and have been used for varied conservative and surgical management of oral diseases[20,21]. The diode laser is a semiconductor that uses solid state elements, such as

gallium, arsenide, aluminum, and indium, to change electrical energy into light energy. The light energy from the diode is greatly absorbed by the soft tissue and poorly absorbed by the teeth and bones [22]. Diode lasers are useful for oral soft tissue surgical procedures because their specific wavelength (810-980 nm) is absorbed not only by water (although less so than the carbon dioxide laser wavelength), but also by other chromophores, such as melanin, and in particular, oxyhemoglobin. Moreover, the exclusive use of this laser by contact or at an extremely close distance avoids damage, due to 'beam escape,' in an open field, which makes it much safer than other laser sources. In addition, diode lasers have the ability to cut the tissue to perform coagulation and hemostasis, and have a higher tissue ablation capacity and enough bleeding hemostatic properties compared to most laser systems[18,21,23].

Clinical experience suggests advantages of the laser over scalpel surgical procedures on oral tissues. These advantages include greater precision, a relatively bloodless surgical and postsurgical course, sterilization of the surgical area, minimal swelling and scarring, minimal or no suturing, and less or no postsurgical pain[24, 25].

#### CONCLUSION

The clinical application of lasers as an alternative to the conventional surgical procedures and its various advantages has made it a desirable and sophisticated treatment option in dental practice. The patients response to the entire treatment procedure was immensely positive. A needleless, relatively bloodless and painless therapy as well as the ease and comfort during operating makes diode lasers a preferable option when compared to the conventional surgical methods.

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