

**CASE REPORT****LASER EXCISION OF ORAL PYOGENIC GRANULOMA: A CASE REPORT**Dr. Kumuda M.N. BDS¹, Dr. Vinaya Kumar R MDS², Dr. Nalini M.S. MDS³¹Post Graduate Student, Department of Periodontology, RajaRajeswari Dental College & Hospital, Bangalore.²Reader, Department of Periodontology, RajaRajeswari Dental College & Hospital, Bangalore.³Reader, Department of Periodontology, RajaRajeswari Dental College & Hospital, Bangalore

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ABSTRACT

The pyogenic granuloma (PG) is primarily an oral disease, relatively common, tumor-like, exuberant tissue response to localized irritation, physical trauma or hormonal factors. Oral PG occurs predominantly on the gingiva, but it is also encountered on the lips, tongue, buccal mucosa and rarely on the hard palate. The peak prevalence of PG is in teenagers and young adults and has more predilection towards females. The most common treatment of PG is surgical excision but alternative approaches, especially laser excision has also been proposed in lieu of better patient acceptance from the functional and esthetic point of view. We report a rare case of pyogenic granuloma in a 60-year-old patient, which was successfully treated by diode laser. Diode laser surgery appears to be a suitable option to conventional surgical excision as it presents numerous intra-operative and post-operative benefits.

Keywords: Pyogenic granuloma, Diode laser.**INTRODUCTION**

Pyogenic granuloma (PG), also called as granuloma pyogenicum is a reactive inflammatory hyperplasia which appears in response to various stimuli such as low-grade local irritation and traumatic injury.¹ Hüllihen's description in 1844 was most likely the first case reported in English literature, but the term "pyogenic granuloma" or "granuloma pyogenicum" was introduced by Hartzell in 1904.² The term is a misnomer as the lesion does not contain pus nor is it granulomatous.³ It develops in about 5% of pregnancies and hence terms like pregnancy tumor and granuloma gravidarum are commonly used.¹ It is considered as a capillary haemangioma of lobular subtype as suggested by Mills, Cooper and Fechner, which is the reason they are often quite prone to bleeding.³

In majority of the cases, minor trauma or irritation are cited in the etiopathogenesis of pyogenic granuloma. The increased incidence of these lesions during pregnancy may be related to the increasing levels of estrogen and progesterone. Infection may play a role with suggestions of agents such as streptococci and staphylococci. Recently, angiopoietin and ephrin B2, agents in other vascular tumors such as Bartonella henselae,

B. quintana and human herpes virus 8 have been postulated to play a role in recurrent forms. Viral oncogenes, hormonal influences, microscopic arteriovenous malformation along with inclusion bodies and gene depression in fibroblasts have all been implicated.¹

Extraoral sites commonly involve the skin of face, neck, upper and lower extremities, and mucous membrane of nose and eyelids. The most common intraoral site is marginal gingiva, but lesions have been reported on palate, buccal mucosa, tongue and lips.³

It clinically manifests as a sessile or pedunculated, resilient, erythematous, exophytic papule or nodule with a smooth or lobulated surface that bleeds easily. It varies in size from few millimeters to several centimeters. The colour ranges from red/pink to purple. Younger lesions are more likely to be red because of the high number of blood vessels. As the lesion matures, the vascularity decreases and the clinical appearance is more collagenous and pink. The peak prevalence is in teenagers and young adults with a female predilection.^{1,4}

Treatment of pyogenic granuloma involves a complete surgical excision. Recurrence of pyogenic granuloma after excision is a known complication but can be prevented. Recurrence rate is said to be 16% of the treated lesions, hence re-excision of such lesions might be necessary. Being a non-neoplastic growth, excisional therapy is the treatment of choice; however, alternative approaches such as cryosurgery, excision by Nd:YAG laser, flash lamp pulsed dye laser, injection of corticosteroids or ethanol, and sodium tetradecyl sulphate, sclerotherapy have been reported to be effective.⁵

In this case report, we discuss the successful treatment of pyogenic granuloma achieved using 970 nm diode laser.

CASE REPORT

A 60 year old female patient reported to the outpatient section of the Department of Periodontology, RajaRajeswari Dental College & Hospital, Bangalore with a chief complaint of swelling in the upper front teeth region since one month. Further enquiry revealed that the patient was apparently normal a month ago following which she observed a small swelling that gradually increased to the present size. There was no pain or other associated symptoms with respect to the swelling. Past medical and dental history was insignificant.

No abnormalities were detected on extraoral examination. Intraoral examination revealed a solitary, pedunculated pink coloured swelling with a smooth surface measuring about 1 cm x 2 cm. It was irregular in shape, originating from the palatal gingiva of 22 extending into the interdental space between 22 & 23 (Figure 1). On palpation, the swelling was soft in consistency, non tender and did not blanch on pressure.



Figure 1: Pre-operative view

Other dental findings were dental caries with respect to 46, root stumps in relation to 26, 48, and 41 along with generalized attrition and abrasion. An intraoral periapical radiograph of the area revealed no abnormalities. Based on the clinical and radiographic findings, the case was provisionally diagnosed as “irritation fibroma.”

After the informed consent of the patient, excisional biopsy was done under local anesthesia using the diode laser (SIROLaser Xtend, Sirona Dental Systems, Germany) at 3W in contact, continuous wave mode and the lesion was sent for histopathologic evaluation (Figure 2 & 3). The patient was advised post-operative antibiotics, analgesics and oral hygiene maintenance measures.



Figure 2: Intra-operative view

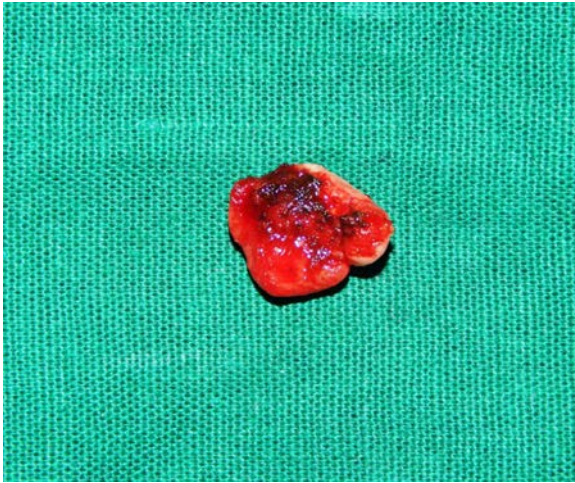


Figure 3: Excised tissue

The excised specimen showed hyperplastic stratified parakeratotic squamous epithelium with an underlying fibrovascular stroma. The stroma consisted of large number of budding and dilated capillaries, plump fibroblasts, areas of extravasated blood and dense inflammatory cell infiltrates (Figure 4). The above histopathologic findings were suggestive of pyogenic granuloma.

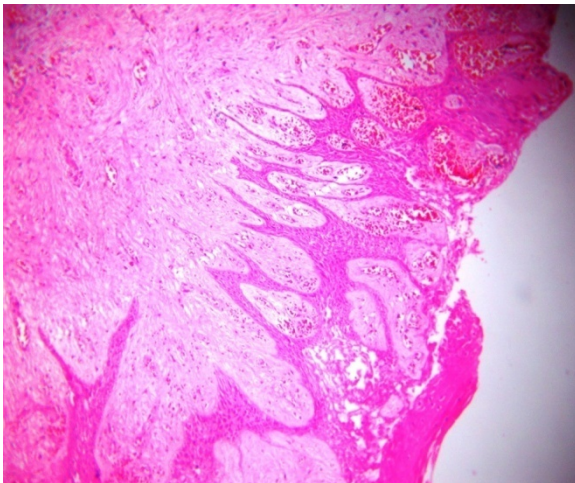


Figure 4: Photomicrograph of histopathological section under low magnification (10x)

The patient was recalled after 24 hours, 1 week and 1 month for postoperative evaluation of the surgical site. The patient was comfortable and the healing was uneventful (Figure 5). She was able to go about her daily activities without any impediment.



Figure 5: Post-operative view

DISCUSSION

Pyogenic granuloma is a common tumor-like growth of the oral cavity or the skin that is considered to be non-neoplastic in nature.² Poncet and Dor in 1897 first described pyogenic granuloma. There are two kinds of pyogenic granuloma namely lobular capillary hemangioma (LCH type) and non LCH type, which differ in their histological features. Over the years various authors have suggested other names such as granuloma gravidarum, pregnancy tumor, Crocker and Hartzell's disease, vascular epulis, benign vascular tumor, hemangiomatosis granuloma, epulis teleangiectaticum granulomatosa, and lobular capillary hemangioma.¹

Approximately one-third of the lesions occur after trauma, so the history of trauma before development of this lesion is not usual. Poor oral hygiene may be a precipitating factor in many of these patients. Some factors such as inducible nitric oxide synthase, vascular endothelial factor, fibroblast growth factor, or connective tissue growth factor are known to be involved in angiogenesis and rapid growth of pyogenic granuloma.¹

Although pyogenic granuloma may appear at any age, 60% cases are observed between the ages of 10 and 40; incidence peaks during the third decade of life and women are twice as likely to be affected. It is more common in children and young adults.³

The clinical presentation is generally of a dull red, sessile, or pedunculated smooth surfaced nodule

that may easily bleed, crust, or ulcerate. Lesions may grow rapidly, reach its maximum size, and remain static. They may typically begin as small red papules that rapidly enlarge to become pedunculated raspberry-like nodules. Rarely, patients may develop multiple satellite angiomatous lesions after excision of a solitary pyogenic granuloma.³

Oral pyogenic granuloma is the most common gingival tumor accounting for 75% of all cases. The lips, tongue, and buccal mucosa are the next most common sites. In the oral cavity pyogenic granulomas show a striking predilection for the gingiva, with interdental papillae being the most sites in 70% of the cases.¹ The maxillary gingiva (especially in the anterior region) is involved more frequently than the mandibular gingiva; the facial gingiva is involved more than the lingual gingiva.⁵

Histologic examination reveals sectioned soft tissue consisting of a lesion composed of ulcerated mucosa covering a core of cellular fibrous connective tissue admixed with proliferating vascular channels and a mixed inflammatory infiltrate. This lesion is a reactive/inflammatory process.⁵

Even though pyogenic granuloma can be diagnosed clinically with considerable accuracy, radiographic and histopathological investigations aid in confirming the diagnosis and treatment. Radiographs are advised to rule out bony destructions suggestive of malignancy or to identify a foreign body. Differential diagnosis of pyogenic granuloma includes fibroma, peripheral ossifying fibroma, irritation fibroma, peripheral giant cell granuloma, metastatic carcinoma, hemangioma, bacillary angiomatosis, angiosarcoma, non Hodgkins lymphoma and amelanotic melanoma.^{1,5}

The most common treatment for PG is surgical excision; however, many other treatment modalities, including different types of laser, have been successfully used. Laser surgery offers more benefits compared to conventional techniques such as reduced bleeding, instant sterilization, reduced bacteremia, less need for sutures and/or post-surgical dressing, decreased pain and edema during and after the procedure, less wound contraction and minimal scar tissue formation,

faster healing process and increased patient acceptance.⁶

Meffert et al used the flash lamp pulsed dye laser to treat a resolute intraoral mass of granulation tissue, and deduced that a series of treatments with the pulsed dye laser worked well on this lesion. White et al used Nd:YAG and CO₂ lasers for the excision of benign intraoral lesions including PGs, which was well endured by the patients without intraoperative or post-operative side effects. Fekrazad et al preferred Er:YAG laser for excision of a gingival PG and stated that the use of Er:YAG laser can be considered as a safe and effective method for the PG excision with minimal invasion. It was also reported that using Er:YAG laser causes less damage on the lesion, rendering the remaining tissue pathologically more valuable. Although CO₂ and Er:YAG lasers are suitable for cutting due to their higher absorption in water and less penetration, they provide less coagulation than Nd:YAG and diode lasers.⁶

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. 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 tissue, perform coagulation and hemostasis, and have a higher tissue ablation capacity and enough hemostatic properties compared to most laser systems.⁷

This article is unique in that it is quite rare to find a pyogenic granuloma in a 60-year old patient. Hormonal imbalance in women undergoing or being in the menopause stage could have triggered the lesion in this patient. Treatment of PG with the diode laser is a viable, safe and effective treatment option. However, long term

follow-up is recommended owing to the high recurrence rate of this lesion.

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