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CASE REPORT

Treatment of Pyogenic Granuloma using Er,Cr:YSGG Laser

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ABSTRACT

Pyogenic granuloma (PG) is a common, usually solitary, benign sessile or pedunculated vascular proliferation of the skin and mucous membranes, presenting as hemorrhagic growth, especially in children and women of reproductive age. The lesion is unrelated to infection and arises in response to various stimuli, such as low grade local irritation, traumatic injury or hormonal factors. This report presents a case of a 47 years old male with a PG in relation to lower anteriors. This lesion was removed using an Er,Cr:YSGG laser. The healing was uneventful and no suture or analgesic was required.

Keywords: Pyogenic granuloma, Er,Cr:YSGG laser, Erbium lasers, Inflammatory hyperplasia.

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INTRODUCTION

Pyogenic granuloma (PG) is a kind of inflammatory hyperplasia. The term 'inflammatory hyperplasia' is used to describe a large range of nodular growths of the oral mucosa that histologically represent inflamed fibrous and granulation tisssues.[1,2] The first report of PG in English literature was described by Hullihen in 1844,[3] but the term 'pyogenic granuloma' or 'granuloma pyogenicum' was introduced by Hartzell in 1904.[4] While some investigators regard pyogenic granuloma as a benign neoplasm,[5] it is usually considered to be a reactive tumor like lesion which arises in response to various stimuli, such as chronic low grade irritation,[6,7] traumatic injury, hormonal factors[8] or certain kinds of drugs.[9]

Being a non-neoplastic growth, excisional therapy is the treatment of choice but some alternative approaches, such as cryosurgery, excision by Nd:YAG laser, flash lamp pulsed dye laser, injection of corticosteroid or ethanol, and sodium tetradecyl sulfate sclerotherapy have been reported to be effective.[10] There are only anecdotal reports of successful treatment of mucosal PGs with Er,Cr:YSGG laser. In this report, we seek to highlight the therapeutic success achieved with Er,Cr:YSGG laser in oral PG.

CASE REPORT

A 47-year-old male patient reported to the outpatient Department of Periodontics, Maulana Azad Institute of Dental Sciences, New Delhi, with a chief complaint of a growth in the mouth involving lower right anterior region, which bled frequently and interfered with eating. Intraoral examination revealed a large soft tissue mass in the lower right labial region extending on to the lingual side approximately 3 × 5 cm in size (Fig. 1). It had a smooth surface laterally and superiorly. The growth was sessile and attached to the marginal gingiva in relation to interdental region between 41 and 42, covering two-thirds of the crowns of 41 and 42. On palpation, the mass was soft to firm in consistency and readily bled on probing. IOPA radiograph of 41 and 42 revealed a slight amount of interdental alveolar crestal bone resorption, which may be suggestive of pressure effect. The hemogram of the patient was within normal limits. The patient was subjected to phase I periodontal therapy before the surgical excision.

Local infiltrative perilesional anesthesia was applied (12 mg of 2% lidocaine with epinephrine 1:100,000). The anesthetic was not infiltrated directly into the lesion to avoid compromising the biopsy result. Patient and staff used special eye glasses for protection. The lesion was treated by Er,Cr:YSGG laser manufactured by Biolase (wavelength: 2780 nm), with the following specifications: Short pulse 'H' mode with 600 µm sapphire tip, 1.5 W power, 13% air and 9% water in noncontact mode (Fig. 2). Once the lesion had been removed, the operation field was wiped with sterile gauze soaked in 1% normal saline solution. A laser bandage was applied with 0.5 W power with air and water switched off (Fig. 3). The patient was advised to avoid smoking, alcohol and spicy foods. No analgesic was prescribed. No

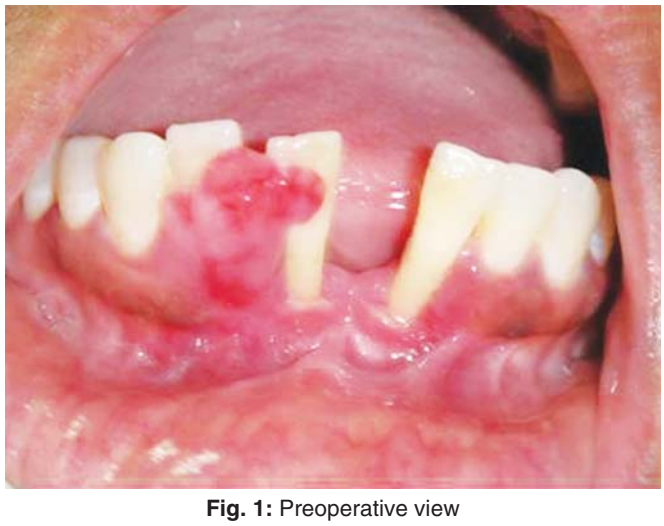

Fig. 1: Preoperative view

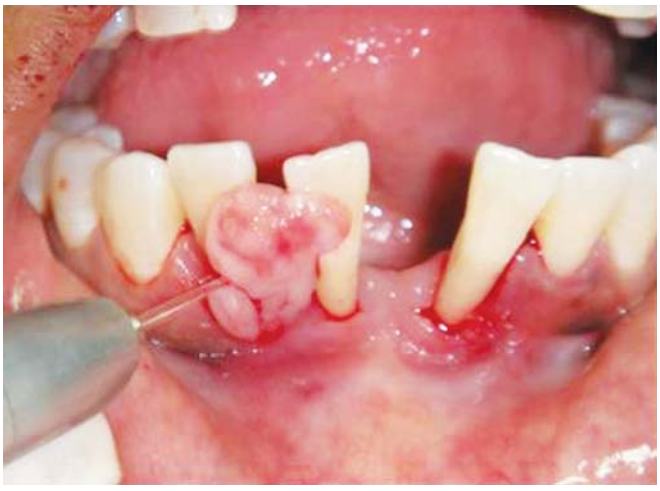

Fig. 2: Intraoperative view

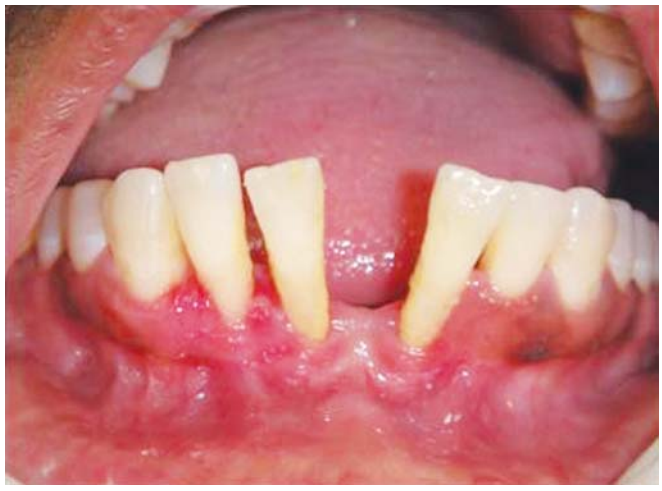

Fig. 4: Postoperative view (after 15 days)

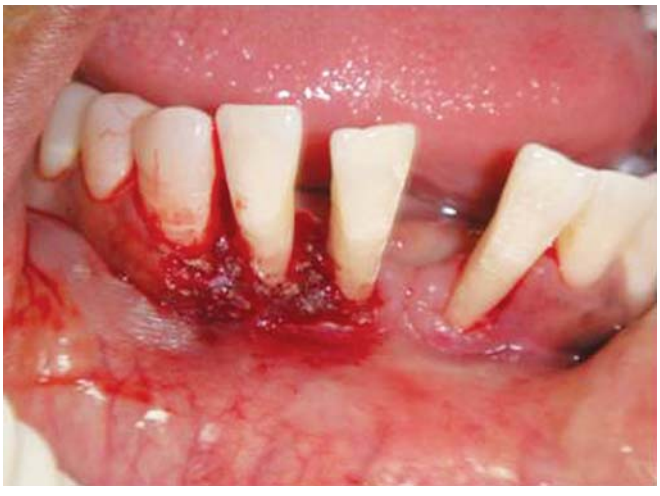

Fig. 3: Postoperative (immediate) view

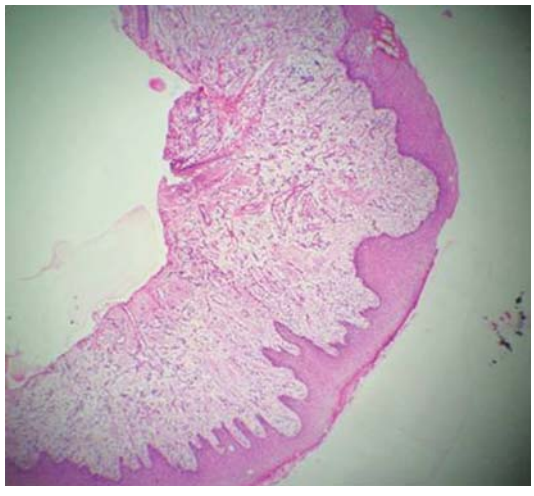

Fig. 5: H&E staining 10×

scar could be palpated or observed 15 days after the intervention (Fig. 4). The patient was followed up for a period of 1 year and no recurrence was observed.

The excised mass was sent for histopathologic evaluation which showed hyperplastic stratified squamous parakeratotic epithelium with an underlying fibrovascular stroma. The stroma consisted of a large number of budding and dilated capillaries, plump fibroblasts and areas of extravasated blood and a dense chronic inflammatory cell infiltrate. The above histopathologic features were suggestive of PG (Fig. 5).

DISCUSSION

Although PG may appear at any age, 60% cases are found between the ages of 10 and 40 years; 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.[11,27]

The clinical presentation is mostly a dull reddish, sessile or pedunculated smooth surfaced nodule which may bleed, crust or ulcerate easily. Lesions can grow rapidly, reach its maximum size and remain static.[12] They can typically begin as small, red papules that rapidly enlarge to become pedunculated raspberry-like nodules. Sometimes patient may develop multiple satellite angiomatous lesions after the excision of a solitary PG.[27]

As seen in this case, oral PGs show a striking predilection for the gingiva which accounts for 75% of all cases. Gingival irritation and inflammation that result from poor oral hygiene may be a precipitating factor in many patients. The lip, tongue and buccal mucosa are the next most common sites.[2,13,27]

In majority of cases, minor trauma and/or chronic irritation are cited in the etiopathogenesis of PG.[14] Infection may play a role with suggestions of agents, such as streptococci and staphylococci.[15,27] Recently, angiopoietin-1, 2 and ephrin B2[16] agents in other vascular tumors such as *Bartonella henselae*, *B. quintana* and human herpes virus 8 have been postulated to play a part in recurrent PG.[17] Multiple PGs with satellite lesions may occur as a

complication of tumor removal or trauma.[18] Viral oncogenes, hormonal influences, microscopic arteriovenous malformation along with inclusion bodies and gene depression in fibroblasts have all been implicated.[19,20,27]

Differential diagnosis of PG includes hemangioma,[2] peripheral giant cell granuloma, peripheral ossifying fibroma and metastatic carcinoma and amelanotic melanoma.[13,27]

Although, the conventional treatment for PG is surgical excision, a recurrence rate of 16% has been reported.[21] There are also reports of the lesion being eliminated with electric scalpel or cryosurgery.[22] Other methods used by various workers include cauterization with silver nitrate, sclerotherapy with sodium tetradecyl sulfate and monoethanolamine oleate[23] ligation, absolute ethanol injection dye,[24] Nd:YAG and CO_2 laser,[25] shave excision and laser photocoagulation.[26,27]

Laser therapy using continuous and pulsed CO_2 and Nd:YAG systems have been used for a variety of intraoral soft tissue lesions such as hemangioma, lymphangioma, squamous papilloma, lichen planus, focal melanosis and PG, because they carry the advantage of being less invasive and sutureless procedures that produce only minimal postoperative pain. Rapid healing can be observed within a few days of treatment, and as blood vessels are sealed, there are both a reduced need for postsurgical dressings and improved hemostasis and coagulation. It also depolarizes nerves, thereby reducing postoperative pain, and also destroys many bacteria and viral colonies that may potentially cause infection. Reduced postoperative discomfort, edema, scarring and shrinkage have all been associated with its use.[26,27]

White et al. suggested that laser excision is well accepted by patients with no adverse effects. They also stated that CO_2 and Nd:YAG laser irradiation is successful in surgical treatment.[10] The Er,Cr:YSGG laser is a very precise ablation instrument that offers certain advantages. It is strongly absorbed by water and causes minimal damage to the adjacent tissues, especially the underlying muscle layers. Due to minimal trauma to the adjacent tissues, postoperative healing was favorable, with very little scar formation. Postoperative bleeding in the case reported was minimal. No sutures were placed after the excision, as the denatured proteins serve as a natural wound dressing. In this case there was little contraction and scarring.[27]

CONCLUSION

The use of laser offers a new tool that can change the way in which existing treatments are performed, or serve to compliment them. Modern medicine needs to explore and take advantage of current trends to derive maximum benefit in terms of technology, patient's acceptance and postoperative management.

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