

Management of Oral Pyogenic Granuloma with 940 nm Diode Laser: A Rare Case Report

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ABSTRACT

Pyogenic granuloma was first described in 1897 by two French surgeons, Poncet and Dor, who named this lesion botryomycosis hominis. Pyogenic granulomas and hemangiomas of the oral cavity are well-known benign lesions. Although, pyogenic granuloma is known to show a striking predilection for the gingiva and capillary hemangioma for lips, cheek and tongue, palatal occurrence of these lesions is extremely rare. The clinical diagnosis of such an uncommon occurrence can be quite challenging, as they sometimes may mimic more serious lesions such as malignancies. The purpose of this article is to report an unusual case of benign tumor occurring on hard palate, which was clinically diagnosed as pyogenic granuloma and histopathologically as capillary hemangioma. The treatment options available are conventional surgical excision; electrocautery and lasers—erbium or diode. This article highlights the use of 940 nm diode laser in surgical excision of oral pyogenic granuloma enumerating its advantages over the conventional available treatment options.

Keywords: Laser excision, Minimal bleeding, Oral pyogenic granuloma, Capillary hemangioma.

How to cite this article: Iyer VH, Sasikumar R. Management of Oral Pyogenic Granuloma with 940 nm Diode Laser: A Rare Case Report. *Int J Laser Dent* 2013;3(3):100-104.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

Pyogenic granulomas^{1,2} of oral cavity are well-known benign lesions and show a striking predilection for the gingiva and capillary hemangioma³⁻⁸ for lips, cheek and tongue. Palatal^{9,10} occurrence of these lesions is, however, extremely rare. The pyogenic granuloma is primarily an oral disease, relatively common, tumor like,¹¹ exuberant tissue response to localized irritation, physical trauma or hormonal factors. The name pyogenic granuloma is a misnomer since the condition is not associated with pus and does not represent a granuloma histologically. It is a reactive inflammatory process filled with proliferating vascular channels, immature fibroblastic connective tissue and scattered inflammatory cells. The surface usually is ulcerated and the lesion exhibits a lobular architecture. No racial predilection is reported. Females are far more susceptible than males because of the hormonal changes that occur in women during puberty, pregnancy and menopause. The pyogenic granuloma has also been called a 'pregnancy tumor' and occurs in 1% of pregnant women.¹² It is always better when possible to wait after delivery to remove the lesion in pregnant women, because of a greater tendency for recurrence during pregnancy. In a number of

cases, mastication on the lesion causes bleeding and pain and requires surgical intervention before parturition. Some pyogenic granulomas regress after childbirth with or without surgical intervention.

Lasers have carved a niche for themselves in today's clinical dentistry due to its ease of usage, less learning curve for the dentist, stress-free dentistry for the operating dentist, with lots of advantages such as minimal or no injections, no bleeding, enhanced visualization of the operating site, minimal pain and swelling postoperatively, less need for pre- and postoperative medication, minimal or no sutures and uneventful healing. This article highlights all these advantages both to the patient as well as to the dentist.

Laser Equipment

A 940 nm diode (Ezlase, Biolase, USA) was used for surgical excision of the pathological lesion as an alternative to conventional excision. Diode surgical soft tissue lasers are class IV lasers and all laser safety precautions need to be followed precisely, such as wearing of protective eyewear specific to the wavelength, minimize reflective surfaces in the operating site and reduce the traffic within the operatory, the laser safety officer is present to ensure all safety protocols are adhered to control the hazards, etc.

CASE REPORT

A 60-year-old female patient had visited our dental office with complaint of an overgrowth at the junction of the hard and soft palates. The pathological lesion (Fig. 1) had grown only for the last 3 months and was increasing in size. The lesion was soft equicolor to the adjacent tissue, firm,



Fig. 1: An intraoral picture of the lesion on the left palatal mucosa

elevated, but sessile measuring around 1×1 cm almost on the left side of the soft palate. The lesion being painless and growing raised an alarm for the concerned patient.

On clinical examination, all the features were confirmed. Biochemical investigatory tests related to enzymes and hormones were performed, which were negative in diagnosis. 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.

Procedure

The patient was made comfortable in the dental chair and protective eyewear was given. Topical anesthetic gel (Precaine contains Lidocaine 8%, Dibucaine 0.8% in a flavored aqueous base) was applied at the surgical site. A 400 μ m initiated 7 mm length (Fig. 2) disposable surgical tip was used. 1 W continuous mode (Fig. 3) was used in contact mode to excise the pathological lesion. Care was taken during the surgical procedure, as vital anatomical

landmarks were in close proximity to the lesion. The position of the lesion also compromised the usage of biopsy forceps due to the gagging reflex. The lesion was excised (Figs 4 to 6) completely and sent for histopathological analysis to a reputed diagnostic laboratory for further analysis. It was clearly mentioned that the lesion was excised using lasers to enable the pathologist to eliminate the borders in case of burnt tissue.

Histopathologically (Figs 7 to 9), the lesion showed thin-walled capillaries surrounded by fibroblasts and infiltrated with acute and chronic inflammatory cells.

Low-level laser therapy (LLLT) was applied on the surgical site (Fig. 10) to aid in positive healing mechanism. No sutures were placed as the lesion was relatively small in size. The patient was recalled after 24 hours (Fig. 11); 1 week, 1 month (Fig. 12) and 1 year (Fig. 13) for postoperative examination of the surgical site. The patient was extremely comfortable during the healing stage. She had not taken any medications and was able to resume her routine daily activities with ease. The patient was, however, under routine medication for diabetes.

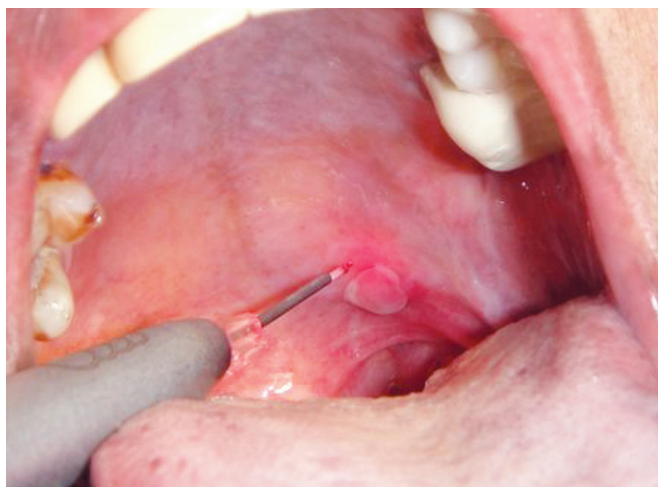


Fig. 2: 940 nm diode laser surgical tip used for excision of the lesion



Fig. 4: Excision of the lesion completely



Fig. 3: Periphery of the lesion is marked using a 400 μ m surgical initiated tip



Fig. 5: The excised lesion

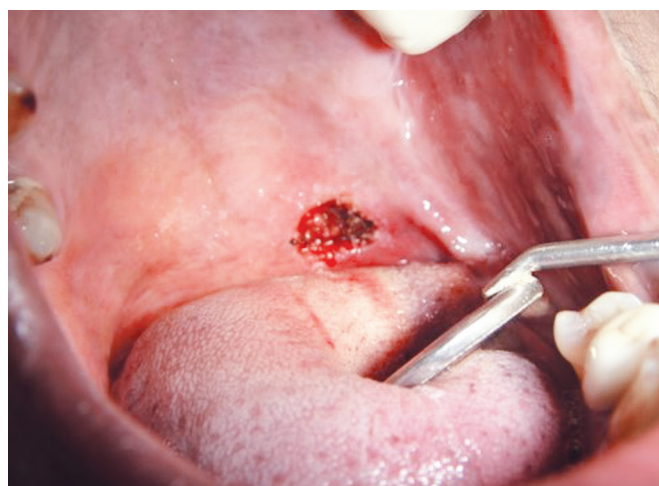


Fig. 6: The immediate postoperative view of the palate

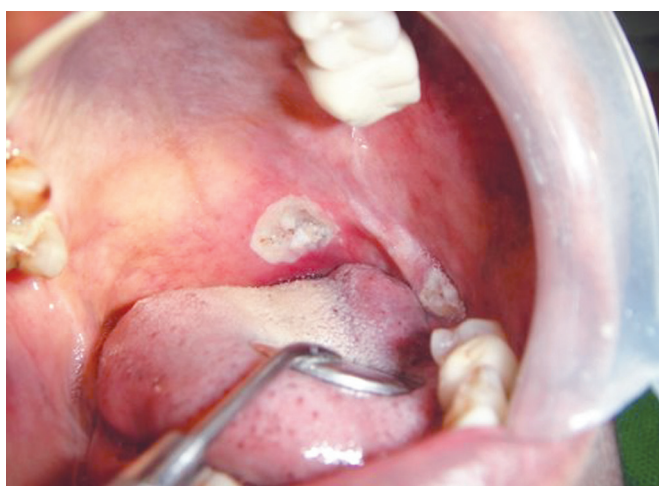


Fig. 7: One day postoperative view, showing the laser Band-Aid



Fig. 8: The excised lesion in slides and wax blocks postanalysis from clinical laboratory

DISCUSSION

Pyogenic granulomas occur at any age, but they most frequently affect young adults. The treatment of choice is conservative surgical excision. The appearance of pyogenic granuloma is usually a color ranging from red/pink to

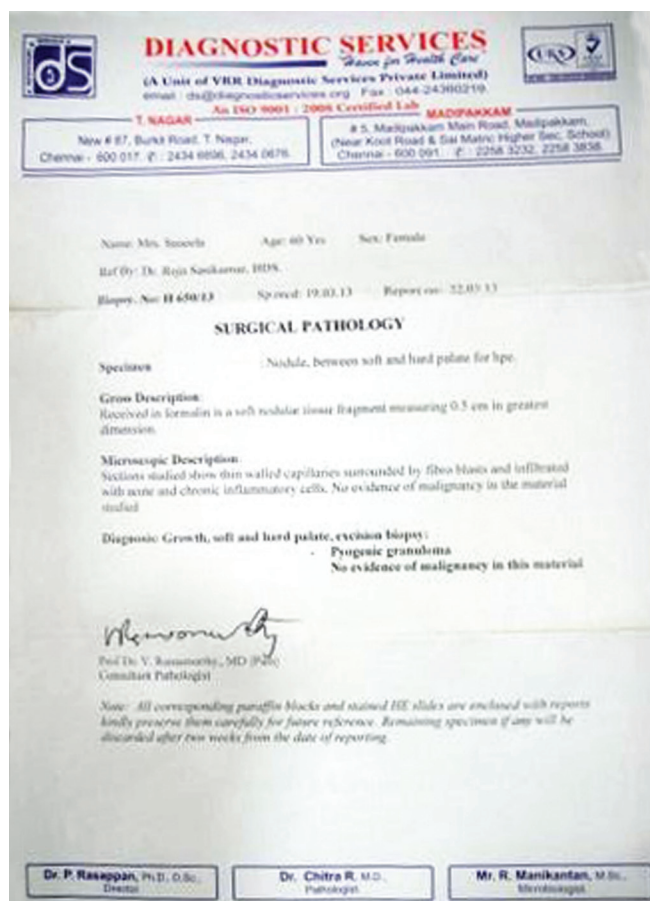


Fig. 9: The histopathological report

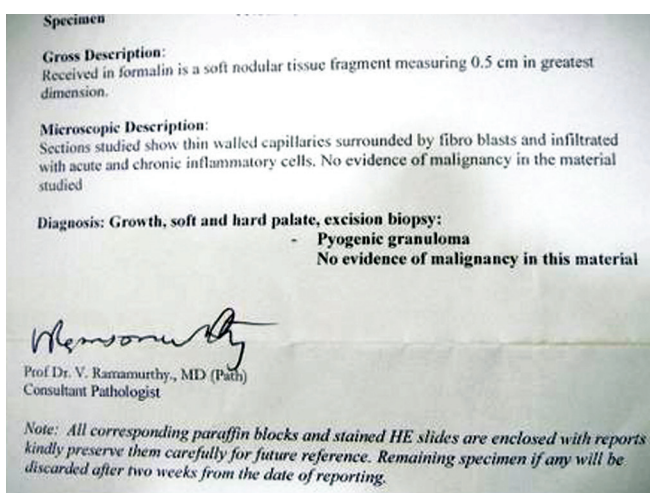


Fig. 10: A close-up view of the report

purple and can be smooth or lobulated. Younger lesions are more likely to be red because of the high number of blood vessels. Older lesions¹³ begin to change into a pink color. Size ranges from a few millimeters to centimeters. It can be painful, especially if located in an area of the body where it is constantly disturbed. The term for pyogenic granuloma¹⁴⁻¹⁷ is misleading as it is a capillary hemangioma of lobular subtype, which is the reason they are often quite prone to bleeding.¹⁸ Pyogenic granulomas can grow rapidly and will often bleed profusely with little or no trauma.



Fig. 11: Laser settings used in excision of the lesion



Fig. 12: One month postoperative view of the site



Fig. 13: One year postoperative view of the site

It is most likely to occur in children and younger adults. In pregnant women,¹⁹ it is most likely to occur in the first trimester with an increasing incidence until the 7th month and is often seen on the anterior nasal septum as a source of frequent nose bleeds. Pyogenic granuloma which occurs during pregnancy may regress in size after parturition due to hormonal changes but still need surgical excision, as

they do not heal spontaneously most of the times. Recurrent bleeding in either the oral or nasal lesions, if esthetics is a concern may necessitate excision and cauterization soon. The recurrence rate is higher for pyogenic granulomas removed during pregnancy.

Pyogenic granulomas appear on the gingiva in 75% of cases, more often in the maxillary than mandibular jaw. Anterior areas are more often affected than posterior areas. It can also be found on the lips, tongue and inner cheek. Poor oral hygiene or trauma is usually precipitating factors. For gingival lesions, excising the lesion²⁰ down to the periosteum and scaling adjacent teeth to remove any calculus and plaque that may be a source of continuing irritation is recommended. Pyogenic granuloma occasionally recurs and a re-excision is necessary. Due to its overwhelming incidence on the gingiva, the condition is often associated with peripheral giant cell granuloma, peripheral ossifying fibroma and hemangioma.^{21,22}

Lasers, a new technology in surgical dentistry, are both doctor and patient-friendly due to its ease of usage and comfort. Diode lasers are compact and light weight and are easy to use. The laser energy is easily absorbed by the colored pigments of the host tissue, such as melanin and hemoglobin which are the chromophores. The laser ablation heals as it seals the blood vessels, hence minimizing the bleeding potential of the surgical site. This aids to better visualization of the surgical site. Pain is also not felt by the patient as the nerve bundles are also sealed. Patients are advised to resume to their normal eating pattern and hence feel comfortable postoperatively. The healing with lasers is uneventful as the patients are able to comfortably carry on with their mundane activities. LLLT in dentistry has been found to accelerate wound healing and reduce pain, possibly by stimulating oxidative phosphorylation in mitochondria and modulating inflammatory responses. LLLT²³⁻²⁶ influences the biological function of a variety of cell types and brings upon a cascade of several beneficial effects upon inflammation and healing on the host tissue. Thus, usage of lasers both to excise the lesion and thereafter for LLLT effect brings about a radical paradigm shift in the healing process.

CONCLUSION

This article is unique as the age of the patient and site of the lesion is a rarity. Hormonal imbalance in women undergoing or being in the menopause stage may have triggered this lesion at the site which is otherwise rare to physical trauma or irritation. The palatal occurrence is another rarity. The clinical applications of lasers as an

alternative to conventional surgical procedures and the numerous advantages have made it a part of elite ethical dental practice. The apprehensive patient was immensely impressed with the treatment outcome of the surgical site. This ease of operation is the unique selling point of any latest technology in today's clinical dentistry. Patients easily embrace such new technology, as they are comfortable during surgery and postsurgical sessions.

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