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Pyogenic granuloma: Case series

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Abstract

Pyogenic granuloma (PG) is a prevalent inflammatory hyperplasia of skin and oral mucosa which is often caused by constant low-grade local irritation, traumatic injury or hormonal factors. In many cases, gingival irritation and inflammation due to poor oral hygiene are precipitating 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.

Case report: 4 patients reported to the Department of Oral Surgery, Army College of Dental Sciences, Secunderabad complaining of a swelling of gums in front and back tooth region in upper and lower arch for past 6 months. The treatment plan included surgical excision of the lesion using diode laser as well as scalpel.

Results: All the Four patients reported no pain after the surgery. They were discharged with a prescription of chlorhexidine mouthwash and necessary post-operative instructions. No recurrence or scarring was observed in 6-12 months follow-up.

Conclusion: Although diode laser is a secure and efficient technique for the treatment of intraoral PG, in order to minimize its recurrence, the lesion should be excised with a wider margin down to the periosteum or to the causing agent. Also due to its high recurrence rate, long-term follow-up is recommended.

Keywords: Pyogenic granuloma, recurrence, diode laser, scalpel excision

Introduction

Soft tissue enlargements of the oral cavity often present with diagnostic challenges because a multiple group of pathologic processes can produce such lesion^[1]. An enlargement can be a variation of normal anatomic structures, inflammation, cysts, developmental anomalies, and neoplasm. Amongst these lesions is a group of reactive hyperplasias, which develop in response to a chronic, recurring tissue injury that stimulates an exuberant or excessive tissue repair response^[1]. Pyogenic granuloma is of the most commonly occurring reactive lesion of the oral cavity which is responsible for soft tissue enlargements.

It is non-neoplastic in nature and therefore it is also referred to as a tumor-like lesion^[1]. Poncet and Dor in 1897 first Occurrence of pyogenic granuloma in man. At that time, it was called botryomycosis hominis. Granuloma pediculatum benignum, benign vascular tumor, pregnancy tumor, vascular epulis, Crocker and Hartzell's disease are the various other names given to the lesion. It was given its present name by Crocker in 1903^[2]. However the term "pyogenic granuloma" was coined by Hartzell in 1904. Although, it does not express accurately the clinical or histopathologic features^[3].

Pyogenic granuloma involves the gingiva most frequently and presents as a nodular growth which may be slow growing or rapid in nature^[3]. It is a common disease of the skin. In the oral cavity it is found in the keratinized mucosa which includes gingiva and the hard palate. The maxillary gingiva is more commonly affected than the mandibular one and the anterior region more than the posterior. Also the lesions are more frequently on the buccal side of the gingiva than the lingual side. It is also found on lips, buccal mucosa and tongue^[4].

There are two types of pyogenic granuloma namely Lobular capillary hemangioma and non-lobular capillary hemangioma which differs mainly on the basis of histopathology^[3]. The course of the lesion can be described as "early," "established," and "healing" type. The colour of the lesion also varies and depends on the vascularity of the lesion in relation to its clinical

course. The early lesions resemble the normal mucosal colour and are usually pinkish. Established lesions are reddish to purplish in colour due to the increased vascularity whereas the late healing type presents as pinkish to whitish mass. These different phases of pyogenic granuloma can be appreciated on the microscopic level as well^[5].

It is painless asymptomatic slowly developing lesion. The size ranges from few millimeters to several centimeters. It can be seen at any age but generally occurs between first to fourth decades of life with peak being the second decade of life. It is most frequently seen in young adult females due to vascularization effect of estrogen and progesterone.

Mostly, a known stimulant or injury such as calculus or foreign material in the gingival crevice, the irritation of the fibro-vascular connective tissue results in exuberant proliferation of a granulation tissue leading to the occurrence of pyogenic granuloma. Other etiological factors that could cause PG are some hormones, certain kinds of drugs (e.g. oral contraceptives, isotretinoin), bacteria and viruses. Deciduous teeth injury, aberrant tooth development and teeth eruption, have also been considered as predisposing factors for PG development^[4].

Differential diagnosis of PG includes peripheral giant cell granuloma, peripheral ossifying fibroma, peripheral odontogenic fibroma, hemangioma, hyperplastic gingival inflammation, conventional granulation tissue, Kaposi's sarcoma, bacillary angiomatosis, angiosarcoma, non-Hodgkin's lymphoma and metastatic cancers. Although Final diagnosis can be made by histopathological investigations only.

Numerous treatment modalities are available for PG. But simple surgical excision of the lesion is the most commonly done treatment. Excision, along with the removal of irritant agents such as dental plaque, calculus, foreign bodies, defective restoration and source of trauma should be carried out. Electric cauterization, cryosurgery, Sodium tetradecyl sulfate, sclerotherapy, Monoethanolamine oleate ligation, absolute ethanol injection, cauterization with silver nitrate,

intralesional steroids, flash lamp pulsed dye laser, neodymium-doped yttrium aluminium garnet (Nd: YAG) laser, carbon dioxide (CO₂) laser, erbium-doped yttrium aluminum garnet (Er: YAG) laser and diode laser have also been used by various clinicians to eliminate the lesion.

PG does not have any malignant transformation potential, the recurrence rate after simple excision is comparatively high and it varies from 6 to 16%; thus in some cases re-excision is required^[6]. Recurrence is because of deficient excision, failure to eliminate etiologic factors or re-injury of lesions. Recurrence rate is observed to be higher in gingival cases than other oral mucosal PG. Recurrence after surgery in extragingival sites is found to be very rare^[4].

Case report

Four patients with a common complaint of swelling of gums in the front and back tooth region of the upper and lower arch accompanied by pain and difficulty during mastication reported to the Department of Oral and Maxillofacial Surgery Army College of Dental Sciences, Secunderabad, Telangana, India. Data regarding their age, sex, site, predisposing factors, clinical characteristics, histopathologic interpretation and treatment were duly recorded. On clinical examination, the size of the lesion varied from 1 cm in diameter up to 8 cm. In all the patients, the lesion was initially of a pin head size and then gradually increased to the present size in the duration of 6 months. Local factors were present around the teeth corresponding to the lesion in all patients. We have found in our patients a combination or superimposition of etiologies, like chronic low-grade irritation from local factors, traumatic injury and hormonal factors.

The treatment plan consisted of thorough oral prophylaxis comprising scaling and root planning to remove the local factors, followed by surgical excision by scalpel as well as laser and histopathological examination of the excised mass. After the treatment all the patients were given necessary post-operative instructions and chlorhexidine mouth wash and all of them were followed up for 1 year with no sign of recurrence.

Case 1



Fig 1: Pyogenic Granuloma found in relation to 21. Excision done using Scalpel.

Case 2



Fig 2: Pyogenic Granuloma found in relation to mandibular anteriors. Excision done using Laser.

Case 3

Fig 3: Pyogenic Granuloma in relation to palate. Excision done along with extraction of 26.

Case 4

Fig 4: Pyogenic Granuloma found in relation to mandibular molar region. Excised used scalpel

Discussion

Pyogenic granuloma is a non-neoplastic growth in the oral cavity. It is a reactive inflammatory process filled with proliferating vascular channels, immature fibroblastic connective tissue and scattered inflammatory cells [6]. Usually the lesion is neither symptomatic nor painful but minor trauma to the growth can induce significant bleeding. Moreover, PG causes functional problems with mastication, swallowing, speaking and may create esthetic problems [7, 8, 9]. In this study the lesion was also painless though it caused discomfort and bleeding while eating, which made the patient seek treatment.

The surface usually is ulcerated and the lesion exhibits a lobular architecture. Gingiva is the most common site of occurrence, accounting for about 75% of the cases [11]. According to Vilmann *et al.*, majority of the PyGs are found on the marginal gingival, with only 15% of the tumors on the alveolar part. Other common sites are lips, tongue and buccal mucosa [12]. Because it is a reactive tumor-like lesion, chronic low-grade irritation, traumatic injury, hormonal factors and certain kind of drugs could be considered as etiologic agents. Poor oral hygiene may be a precipitating factor in many patients [13].

The microscopic picture of pyogenic granuloma in general shows exuberant granulation tissue which is covered by atrophic/hyperplastic epithelium that may be ulcerated at times and reveals fibrinous exudates. Presence of numerous endothelium-lined vascular spaces and proliferation of fibroblasts and budding endothelial cells are the characteristic features of pyogenic granuloma. Presence of mixed inflammatory cell infiltration is also observed [14].

Excisional biopsy is the most commonly indicated treatment of Pyogenic granuloma. However management of pyogenic granuloma depends upon severity of symptoms. If the lesion appears to be very small clinical observation and follow up are advised. Although conservative surgical excision and removal of causative irritants are the usual treatment which are followed. In our case report also thorough scaling and root

planning was carried out in all the patients followed by surgical excision followed by biopsy in three cases. The other treatment modalities, include cryosurgery, electrodissection, sclerotherapy including Sodium Tetracycl Sulphate and various types of laser, which have also been successfully used [8, 15-17]. Laser surgery offers more benefits compared to conventional treatment modalities 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 patients acceptance [8, 18].

Powell *et al* [19] reported one of the first uses of Nd: YAG laser for excision of PG, and noticed decreased risk of bleeding in comparison to other methods along with superior coagulation characteristics; which were the reasons why they chose Nd: YAG laser. Kocaman *et al.* [8] proposed the use of Nd: YAG laser in the treatment of PG, due to its effect of decreasing bleeding during operation with a consequent reduction in operating time, promoted postoperative hemostasis and better patient acceptance. In contrast to this, we had used Diode lasers for the removal of pyogenic granuloma which provided us with the same satisfactory results as by Powell *et al.* and Kocaman *et al.*

Rai *et al.* [20] used diode laser for the treatment of an intraoral Pyogenic granuloma. Complete healing of the lesion was achieved without any complication, and the researchers concluded that diode laser could be a good therapeutic choice for intraoral Pyogenic granulomas. In our case we also chose diode laser as it provides bloodless surgical field, which is crucial in hemorrhagic lesions, improves hemostasis and coagulation, with minimal swelling and scarring after surgery. Several studies have reported that after simple excision, recurrence occurs in up to 16% of lesions [21-23]. Bhaskar and Jacoway has reported recurrence rate of 15.8% after conservative excision [2]. Recurrence can be resulted from insufficient excision, failure to eliminate etiologic factors and/or repetitive trauma. Recently, angiopoietin 1, 2 and

ephrin b2, agents in other vascular tumors such as Bartonella henselae, B. Quintana and human herpesvirus-8, have been presumed to have a part in PG recurrence. Viral oncogenes, hormonal influences, microscopic arterio-venous malformation along with inclusion bodies and gene depression in fibroblasts, have also been implied as causes of Pyogenic granuloma recurrence. In addition, it should be underlined that generally the recurrence rate is much higher in gingival cases than other oral mucosal sites [2, 20-24]. All our cases were followed up for 1 year and none of them presented with any recurrence. Thorough scaling and root planning with complete removal of irritants and also complete surgical as well as laser excision could have been the reason for no recurrence.

Conclusion

Although the use of diode laser in the management of intraoral PG is a safe technique with several clinical benefits but excisional surgery is the preferred treatment method; clinician should eliminate all the causative irritant and/or source of trauma, and the lesion should be excised with 2 mm margins at its clinical periphery and to a depth up to the periosteum to prevent the recurrence of PG. Even so, due to its high recurrence rate, long-term follow-up is recommended.

Conflict of interest

The author has no conflict of interest to declare.

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