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Case Report

Oral pyogenic granuloma: one reactive hyperplastic lesion of the gingiva

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ABSTRACT

The term pyogenic granuloma refers to a disorder of the skin, oral mucosa and the gingiva, that usually presents as a solitary polypoid capillary hemangioma like growth often resulting from local irritation and trauma. It is manifested as an inflammatory response with similar characteristics to those of a granuloma. Different terminologies are used for this lesion by different investigators like, benign vascular tumor of pregnancy, granuloma pediculatum benignum, granuloma pyogenicum, Crocker and hartzell's disease. This lesion even if looks like a tumor, is non neoplastic in nature and present itself in various clinical and histological forms. Lack of association of pyogenic etiopathogenesis does not justify the use of terminology of pyogenic granuloma. In this article we are presenting a case series of pyogenic granuloma in different locations giving an insight into their myriad of etiologies and presenting the review of literature for its inclusion as one classified hyperplastic lesion of oral cavity.

Keywords: Fibrous hyperplasia, Peripheral giant cell granuloma, Peripheral ossifying fibroma, Pyogenic granuloma, Reactive hyperplastic lesions

INTRODUCTION

Pyogenic granuloma (PG) is a non neoplastic, benign inflammatory lesion, which occurs as one primarily a disease of the oral cavity and skin. This lesion arises in response to various stimuli such as low-grade local irritations, traumatic injury and hormonal factors.[1] In English literature Hullihen described the first case of Pyogenic granuloma in 1844.[2] Report on etiology and the pathogenesis of the pyogenic granuloma reveal that, micro trauma due to tooth brushing and gingival inflammation seem to be pathogenic elements. Thus it is suggested that pyogenic granuloma is a localized tissue response to non-specific irritants.[3] In addition to low-grade irritation, traumatic injury, it also develops as an overgrowth of tissue in response to other stimuli like hormonal factors. Young females in the second decade of their life, possibly because of a vascular effect due to hormonal changes develop such lesions.[4]

This lesion is also suggested to be one of the common benign oral soft tissue masses occurring in the oral cavity, those include traumatic fibroma, pyogenic granuloma, mucocele, warts or papilloma, peripheral giant cell granuloma, generalized gingival hyperplasia, lateral periodontal cyst, lipoma, denture induced hyperplasia.[5] Vascular lesions of skin like port-wine stains, has been described to be associated with the occurrence of recurrent pyogenic granuloma. It has been postulated that this association is promoted by arteriovenous anastomoses in the vascular lesions, leading to the development of pyogenic granuloma.[6] Surgical removal of the lesion through total excision biopsy with removal of irritants like occlusal interferences, plaque, calculus,

periodontal pockets, defective restorations are the recommended line of treatment. The literature has shown that, In addition to use of normal scalpel blades, lasers, cryosurgery is also one very useful technique for treatment of oral lesions of pyogenic granuloma. Liquid nitrogen spray or cryoprobe have been used alone or associated with other surgical methods for removal of pyogenic granuloma. Sclerotherapy have been shown to be one useful technique for treatment of oral lesions of pyogenic granuloma. Sodium tetradecyl sulphate sclerotherapy successfully cleared the lesions in most patients without major complications.[7,8]

Surgical excisions followed by CO2 laser ablation are the first-choice of treatment for PGs.[9] In this article, we have presented a case series of pyogenic granuloma of the gingiva for reviewing the different possible etiological factors. We also reviewed the literature in support of its inclusion as one of the classified reactive hyperplastic lesion of gingiva.

CASE REPORT

Case 1: Pyogenic Granuloma (Lobular Capillary Haemangioma)

A 45 year female reported to the department of periodontics, SCB Dental College, complaining of swelling on the lower right disto molar areas. The swelling was causing pain and discomfort while chewing. While taking history it is learnt that, the patient had developed this growth since last 3 years. Initially the growth was painless, keeps on growing gradually and reached the present size as shown in the Figure 1. The growth keeps on bleeding while brushing.

The lesion was painful while chewing on that side; the pain was due to mechanical trauma. On intraoral examination, the growth was found to be large sessile lobulated extending on retro molar area of 47, was pale pink in color with 38×28 mm in size. The surface was smooth, ovoid and lobulated free from ulcerations. Buccally it extended beyond the occlusal plane of teeth. Oral hygiene was poor on lingual side of the lesion because of difficulty in maintenance of the same. No mobility was associated with the teeth adjacent to the lesion. Radio graphically; there was evidence of periodontal bone loss on adjacent teeth. One supra erupted tooth opposing the lesion was found to be associated for precipitating the irritation. There was no abnormality found in routine hemogram. A provisional diagnosis of pyogenic granuloma was made. The differential diagnosis included peripheral ossifying fibroma, peripheral giant cell granuloma, hemangioma and fibroma. The patient did not have any systemic problems, so was prepared for surgery on the basis of the clinical and radiographic evidence. Oral prophylaxis was completed and the lesion was excised under aseptic conditions. Excision of the lesion up to and including the mucoperiosteum was carried out under local anesthesia using a scalpel and blade (Figure 4), followed by curettage and through scaling of the involved teeth. Periodontal dressing was placed and the patient was recalled after 1 week for removal of the pack and check-up. The excised tissue was sent for histopathology examination. Three years follow up with periodontal maintenance care ruled out the recurrence of the lesion.

Figure 1: Pyogenic granuloma (non lobular capillary haemangioma).

Figure 2: Pyogenic granuloma (lobular capillary haemangioma).

Histopathologic features include, Proliferation of para keratinized epithelium found towards the base of the lesion. The underlying connective tissue stroma is filled with dilated and engorged blood vessels with extravasation of red blood cells, angiogenesis, few inflammatory cells and bundles of collagen fibers. The diagnosis of this lesion was confirmed to be pyogenic granuloma of non lobular capillary haemangioma variety.

Case 2: Pyogenic granuloma (lobular cappilary haemangioma)

A 50 year old male reported to the department of periodontics, SCB Dental College, Odisha, India, presented with one growth on the lower jaw on right side for last 2 years, with history of pain and discomfort while chewing. The growth keeps on bleeding after chewing and brushing. On intraoral examination, the growth was found to be large sessile lobulated extending on distal aspect of lower canine on left side. It was reddish pink in

color with 38×28 mm in size (Figure 2). The surface was ovoid, lobulated, with mild surface ulcerations. Buccaly it extended beyond the occlusal plane of teeth. All the lower incisors teeth involved by the lesion are mobile. There was no abnormality found in routine hemogram. A provisional diagnosis of pyogenic grnuloma was made. Excision of the lesion up to and including the mucoperiosteum was carried out using scalpel and blade, with extraction of the involved teeth under local anesthesia (Figure 5). Patient was disposed after putting periodontal dressing and the patient was recalled after 1 week for removal of the pack and check up. The excised tissue was sent to for histopathology examination. Histopathologic features include irregular lobular arrangement of capillaries, The lobules consist of discrete clusters of endothelial cells, indistinct lumina. Nonspecific changes of granulation tissue reaction found on superficial portion.

Figure 3: Focal fibrous growth (fibroma).

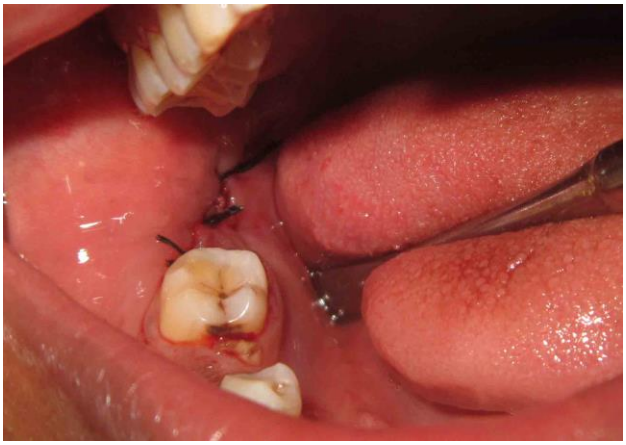

Figure 4: Pyogenic granuloma (non lobular capillary haemangioma) after excision.

Case 3: Focal fibrous hyperplasia

A female aged 14 years found to develop firm, sessile, ovoid, asymptomatic, smooth-surface swelling around lower 2nd premolar on right side involving both buccal and lingual aspect. The diameter of which is around 7 mm on labial aspect and 8 mm on lingual aspect. The only significant factor associated here is, mildly rotated 2nd pre molar subjected to occlusal trauma. The lesion (Figure 3) was hard in consistency and pale pink in color, with no signs of inflammation or surface ulcerations which have been reported by some authors. Focal fibrous hyperplasia or fibroma most often occur on the buccal and lingual aspect of attached gingiva along the plane of occlusion of the maxillary and mandibular teeth.

Figure 5: Pyogenic granuloma (lobular capillary haemangioma) after excision.

Figure 6: Focal fibrous growth (fibroma) after excision.

The lesion was excised using scalpel and blade under local anesthesia, followed by curettage and through scaling of the lower right 2nd premolar (Figure 6). Patient was disposed after putting periodontal dressing and the patient was recalled after 1 week for removal of the pack and check-up. The excised tissue was sent for histopathology examination. The sections showed hyperplastic stratified squamous epithelium, hyperkeratotic in major portion. Thin, finger like rete ridges extending into underlying connective tissue stroma which was fibro cellular with solid nodular mass of dense hyalinised fibrous connective tissue.

DISCUSSION

Etiopathogenesis & treatment

Pyogenic granuloma is caused by local irritation, injury, stimulant such as calculus, occlusal interferences, foreign material and routine tooth brushing habits causing repeated trauma to the gingiva. Repeated trauma within the gingival crevice results in exuberant proliferation of connective tissue. Release of variety of endogenous substances and angiogenic factors caused disturbances in the vascularity of the affected area. Hormonal factors in young females and during pregnancy could be attributed to be responsible for development of these lesions .[1-6]

Surgical removals of the lesion with withdrawal of irritants are the recommended protocol of treatment of pyogenic granuloma. Total excision biopsy with use of normal scalpel blades, lasers, cryosurgery, Sodium tetradecyl sulphate sclerotherapy are very useful techniques for treatment of oral lesions of pyogenic granuloma.[7-9]

Classifications of reactive hyperplasia

Data of all reactive hyperplasia namely pyogenic granuloma (PG), peripheral ossifying fibroma (POF), peripheral giant cell granuloma (PGCG) and focal fibrous hyperplasia (FFH), , were reviewed and analyzed for age, gender, and site of location. FFH was the most common lesion constituting 57.4% of the cases, followed by PG (18.7%), POF (17.7%) and PGCG (6.22%). The mean age of patients at presentation was 31.56 years. The female to male ratio was 1.5:1. The most frequently involved site was the gingiva (81.8%).[10]

It has been observed that, among all the reactive lesions of oral cavity chance of occurrence of pyogenic granuloma and focal fibrous hyperplasia may occur on any oral mucosal site but more frequently in the mandibular anterior gingiva and buccal mucosa. Peripheral giant cell granuloma and peripheral ossifying fibroma occur exclusively on the mandibular gingiva.[11]

Localized hyperplastic lesions of the gingiva (epulides) were classified into five groups: pyogenic granuloma, calcifying fibroblastic granuloma, fibrous hyperplasia, peripheral giant cell granuloma and denture hyperplasia. Pyogenic granuloma was found to be the most common lesion on the gingiva and occurring in younger patients.[12]

The expression epulis is no more used as a microscopic designation for lesions in the oral mucosa, as it does not represent a uniform group. It comprises of differing lesions histogenetically and histomorphologically, designation is based on non-specific topographico-clinical concept.[13]

Epulis is classified as:[13]

a) Oral mucosal granulomatous hyperplasias: granulomatous gingivitis, gingivitis of pregnancy, granuloma gravidarium, pyogenic granuloma, epulis angiomatosa and epulis telangiectaticum.[13]
b) Oral mucosal fibrous hyperplasias: Fibrous epulis, epulis fissuratum, fibroepithelial lesions, denture injury tumor and peripheral odontogenic fibroma.[13]
c) Oral mucosal giant cell hyperplasia: peripheral giant cell granuloma and giant cell epulis.[13]

Localized hyperplastic lesions of the gingiva were reclassified into four groups: pyogenic granuloma, fibrous hyperplasia, peripheral giant cell granuloma, and peripheral fibroma with calcification. Fibrous hyperplasia was the most common type of localized hyperplastic lesions, followed in descending order by pyogenic granuloma, peripheral fibroma with calcification and peripheral giant cell granuloma. Pyogenic granuloma and peripheral fibroma with calcification were more common in females. Pyogenic granuloma and peripheral fibroma with calcification occur in younger patients.[14]

From animal studies it was concluded that, epulis is a non-specific, clinical designation for a localized, exophytic growth on the gingiva. Four reactive epulides occur in human beings, namely focal fibrous hyperplasia (fibrous epulis), pyogenic granuloma, peripheral giant cell granuloma (giant cell epulis), and peripheral ossifying fibroma (calcifying fibrous epulis).[15]

Localized reactive hyperplastic lesions (LRHL) develop due to chronic irritation or trauma to the gingiva. Those can be classified into four groups: focal fibrous hyperplasia (FFH), pyogenic granuloma (PG), peripheral ossifying fibroma (POF), and peripheral giant cell granuloma (PGCG). FFH was the most common (31.8%); followed by PG (29.1%), POF (20.4%), and PGCG (18.7%).POF tended to affect younger patients and was more common in women.[16]

In a study for analysis of biopsy specimens from the gingiva and the alveolar mucosa by Stable in MJ and others, it is observed that in both regions, inflammatory reactive hyperplasia accounted for about 85% of the lesions and neoplasia for most of the remainder. Pyogenic granuloma was the most common lesion in the gingiva, whereas fibrous hyperplasia in the alveolar mucosa. The ratio of benign to malignant neoplasms was greater in the gingiva than in the alveolar mucosa.[17]

Thus pyogenic granuloma is one of the member of reactive hyperplastic lesions, those can be classified broadly into 4 groups such as: 1- fibrous hyperplasia, 2- pyogenic granuloma, 3- peripheral ossifying fibroma, 4- peripheral giant cell granuloma.[10-17]

On the basis of its clinical presentation and histologic appearance, the clinical term "pregnancy tumor is compared to pyogenic granuloma and other variety of hyperplastic lesions to check the correlation exists if any

between hyperplastic lesions and pregnancy. Clinical and behavioural features of pregnancy tumors diagnosed microscopically as pyogenic granuloma during pregnancy, because it describes a distinct lesion not on the basis of histologic features but on etiology, biologic behavior, and treatment protocol.[18]

Histopathology

There are two broader histopathological groups of pyogenic granulomas are usually reported in oral cavity, the lobular capillary hemangioma and non- lobular capillary hemangioma.

a) Lobular arrangement of capillaries at the base is one histopathologic diagnostic feature of pyogenic granuloma in lobular capillary hemangioma variety. The lobules consist of clusters of endothelial cells with a wide variation of lumina. Nonspecific changes of inflammation, capillary dilatation, and a granulation tissue reaction with stromal oedema is found on superficial portions of the lesion. That is why; accurate, descriptive term lobular capillary hemangioma is used to designate the histopathological character of pyogenic granuloma. Lip, nasal mucosa, oral mucosa and tongue are the common sites of lobular capillary hemangioma.[19-20]
b) A significantly greater number of vessels with perivascular mesenchymal cells non-reactive for alpha-smooth muscle actin and muscle-specific actin are present in the central area of pyogenic granuloma of non- lobular capillary hemangioma variety, compared to lobular capillary hemangioma variety. Lobular capillary hemangioma variety of pyogenic granuloma usually presents as a spontaneous, painless, bleeding mass.[19-20]

Here we have reported, cases of large gingival pyogenic granulomas of gingiva in both male and female patients giving an insight into their myriad of aetiologies, clinical features, histological presentations, treatment modalities and recurrence rates. It was highlighted that, pyogenic granuloma is one of the member of reactive hyperplastic lesions and broadly divided into two types of histopathological groups, lobular capillary hemangioma and non- lobular capillary hemangioma. The hyperplastic reactions are always associated with number of interactive etiological factors.

CONCLUSION

Knowledge of the frequency and presentation of the most common oral lesions is beneficial for dental professionals during their practice for minimizing potential of dentoalveolar complications. All reactive hyperplastic lesions of gingiva show some differences in sex predilection, location, clinical and histopathologic features. Reactive hyperplastic lesions can be classified broadly into 4 groups such as: 1- fibrous hyperplasia, 2- pyogenic granuloma, 3- peripheral ossifying fibroma, 4- peripheral giant cell granuloma. Pyogenic granuloma is one of the important reactive hyperplastic lesions of the gingiva. Complete removal of the lesion and with drawl of local irritants with follow-up care, as well as dental hygiene maintenance are the recommended treatment protocol of this lesion.

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