ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

*International Journal of Dental Science and Innovative Research (IJDSIR)*

*IJDSIR : Dental Publication Service*

*Available Online at: www.ijdsir.com*

*Volume – 3, Issue – 2, March - 2020, Page No. : 32 - 39*

# Lobular Capillary Hemangioma or Pyogenic Granuloma: A Routine or Chance Co-Relation with Periodontitis- A Case Series

[1]Pankaj Londhe, Post Graduate Student, MGM Dental College and Hospital, Navi Mumbai

[2]Vineet Kini, Professor, MGM Dental College and Hospital, Navi Mumbai

[3]Sujeet Khiste, Reader, MGM Dental College and Hospital, Navi Mumbai

[4]Ankita Deshmukh, Lecturer, MGM Dental College and Hospital, Navi Mumbai

[5]Shrushti Sukalkar, Post Graduate Student, MGM Dental College and Hospital, Navi Mumbai

**Correspondence Author:** Pankaj Londhe, Post Graduate Student, MGM Dental College and Hospital, Sector 18, Kamothe, Navi Mumbai-410209

**Citation of this Article:** Pankaj Londhe, Vineet Kini, Sujeet Khiste, Ankita Deshmukh, Shrushti Sukalkar, "Lobular Capillary Hemangioma or Pyogenic Granuloma: A Routine or Chance Co-Relation with Periodontitis- A Case Series", IJDSIR- March - 2020, Vol. – 3, Issue -2, P. No. 32 – 39.



**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

## Abstract

Pyogenic granulomas and hemangiomas of oral cavity are well studied benign lesions. Even though 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 acumen of the surgeon for the diagnosis of such an uncommon occurrence is important as they sometimes may mimic more serious lesions such as malignancies. The purpose of this case series is to report unusual cases of benign tumor occurring on hard palate and alveolus involving the marginal gingiva which was clinically diagnosed as pyogenic granuloma and histopathologically as capillary hemangioma.

**Keywords** Granuloma, Hemangioma, Cheek, Palate, Hard

## Introduction

Pyogenic granulomas of the oral cavity are known to involve the gingiva commonly. It is a misnomer as this condition is not associated with pus and does not represent a granuloma histologically. In fact, on the basis of the histopathological picture; it is also called lobular capillary hemangioma.

The term hemangioma is a generic one used to describe congenital hamartomas and vascular malformations. The congenital hemangioma is often present at birth and may become more apparent throughout life. Vascular malformation may be identified by the presence of a thrill or bruit [1]. There is a higher incidence in females (65%) than males (35%) [2].

Although hemangioma is a common tumor of the head and neck, it is relatively rare in the oral cavity especially in oral soft tissues and uncommonly encountered by the dental profession [3].

In this article, we have presented case reports of a large pyogenic granulomas/ capillary hemangiomas of the gingiva and palate in healthy individuals who presented with a localized tumor like enlargement in both, maxillary and mandibular arches. We have also reviewed the literature and discussed the present cases with reference to the same and have highlighted why the term pyogenic granuloma is a misnomer.

**Case Report**

A 27year old male patient reported to the Department of Periodontics with the chief complaint of swelling in his upper front region of jaw since 1 month. On general history taking it was noted that the patient had no relevant medical history. Clinical examination revealed a diffuse, pedunculated, soft in consistency, non-fluctuant and non depressible swelling which was approximately 10 ×10 mm in size. The swelling was lobulated showing surface erythema and was associated with the interdental papilla with respect to 21,22 partially covering the crowns.

Treatment of the lesion was planned doing an excisional biopsy using scalpel by lasso technique [2]. The area was infiltrated with 2% lignocaine in 1:2,00,000 adrenaline. The lesion was held with a lasso made up of dental floss and was excised by placing incisions around the borders and a simple interrupted black braided suture (BBS) was placed. The excised specimen was then sent for histopathologic investigation. Follow up for 12 months was done to evaluate whether any recurrence had occurred.

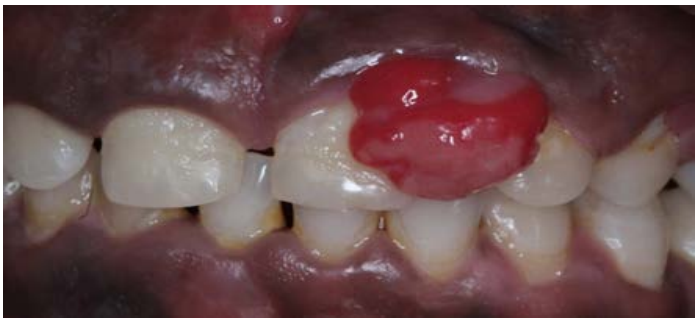

Figure 1

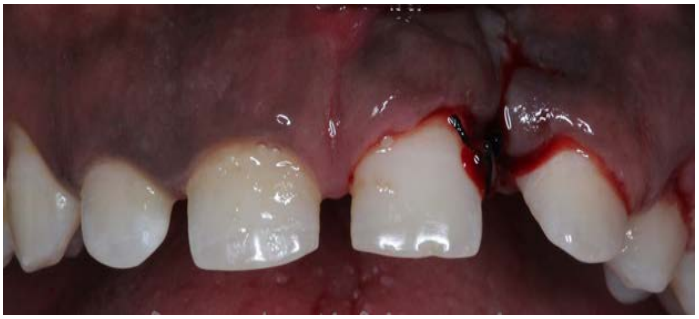

Figure 2

**Case Report**

A 22year old male patient reported to the Department of Periodontics with the chief complaint of swelling in his upper back region of jaw since 2 months. On general history taking it was noted that the patient had no relevant medical history. Clinical examination revealed a solitary, sessile, soft in consistency, non-fluctuant and non-depressible swelling which was approximately 9 ×5 mm in size. The swelling was lobulated showing surface erythema and was associated with the palatal gingiva of 16 without involving the crown.

Treatment of the lesion was planned doing an excisional biopsy using scalpel. The area was infiltrated with 2% lignocaine in 1:2,00,000 adrenaline. The excised specimen was then sent for histopathologic investigation. Follow up for 6 months was done to evaluate whether any recurrence had occurred.

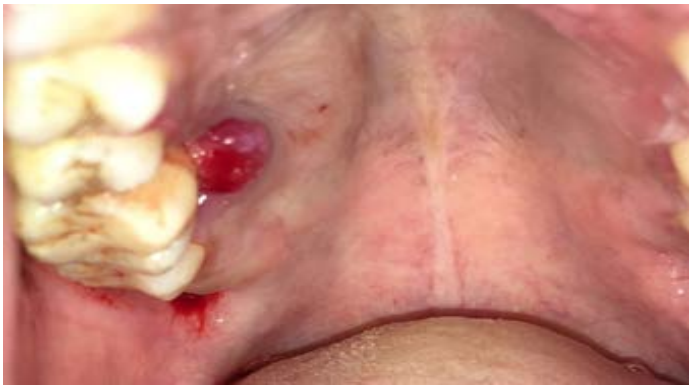

Figure 3

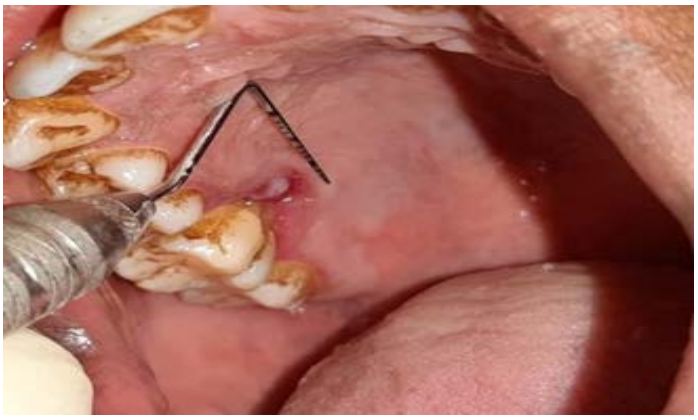

Figure 4

**Case Report**

A 26year old male patient reported to the Department of Periodontics with the chief complaint of swelling in his upper front region of jaw since 1 month. On general history taking it was noted that the patient had no relevant medical history. Clinical examination revealed a solitary, pedunculated, soft in consistency, non-fluctuant and non-depressible swelling which was approximately 9 ×10 mm in size. The swelling was Cauliflower like, lobulated showing surface erythema and was associated with the palatal gingiva of 21,22 covering 2/3$^{rd}$ crown structure of 22 and 1/3$^{rd}$ of 21.

Treatment of the lesion was planned doing an excisional biopsy using scalpel. The area was infiltrated with 2% lignocaine in 1:2,00,000 adrenaline. The excised specimen was then sent for histopathologic investigation. Follow up for 6 months was done to evaluate whether any recurrence had occurred.

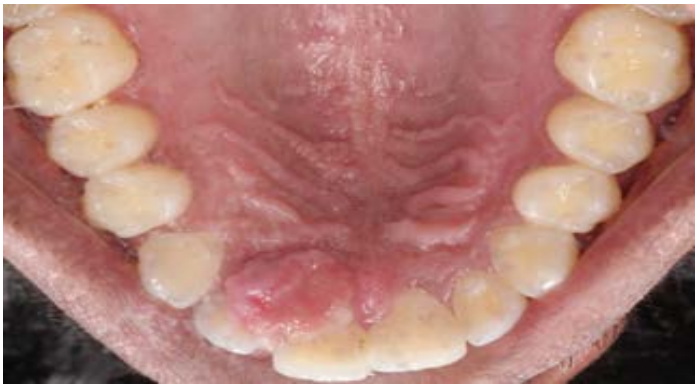

Figure 5

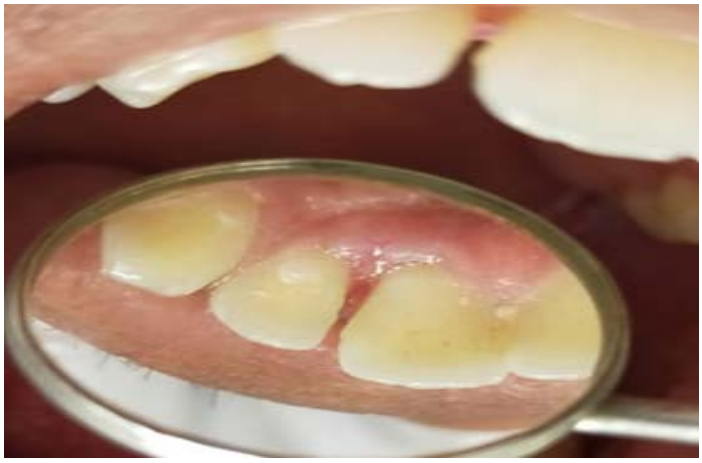

Figure 6

**Case Report**

A 35year old female patient reported to the Department of Periodontics with the chief complaint of swelling in her upper front region of jaw since 20 days. On general history taking it was noted that the patient had no relevant medical history. Clinical examination revealed a solitary, well defined, sessile, soft in consistency, non-fluctuant and non-depressible swelling which was approximately 4 ×4 mm in size. The surface of the swelling was smooth and shiny showing surface erythema and was associated with the labial marginal gingiva of 11 covering cervical 3$^{rd}$ of crown structure of the tooth. In addition, radiographically angular bone loss was seen with respect to mesial aspect of 11.

Treatment of the lesion was planned doing an excisional biopsy using scalpel. The area was infiltrated with 2% lignocaine in 1:2,00,000 adrenaline. The excised specimen

was then sent for histopathologic investigation and guided tissue regeneration (GTR) for grafting of the defect present with respect to mesial aspect of 11 was done using Freeze dried bone allograft (FDBA) and cross linked collagen membrane (Healiguide). Closure was achieved with the help of 4-0 Vicryl sutures. Follow up for 6 months was done to evaluate whether any recurrence had occurred.

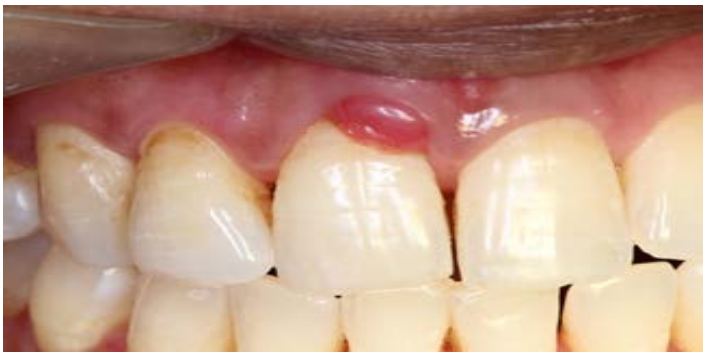

Figure 7

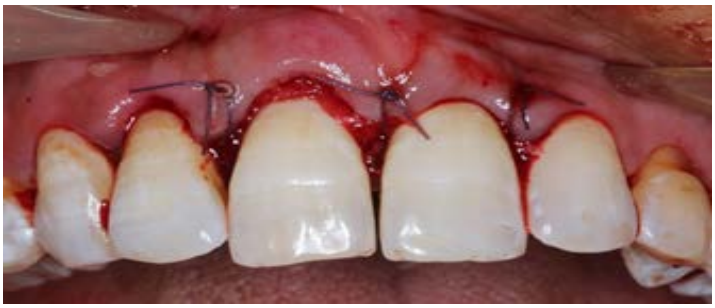

Figure 8

**Histopathological sections**

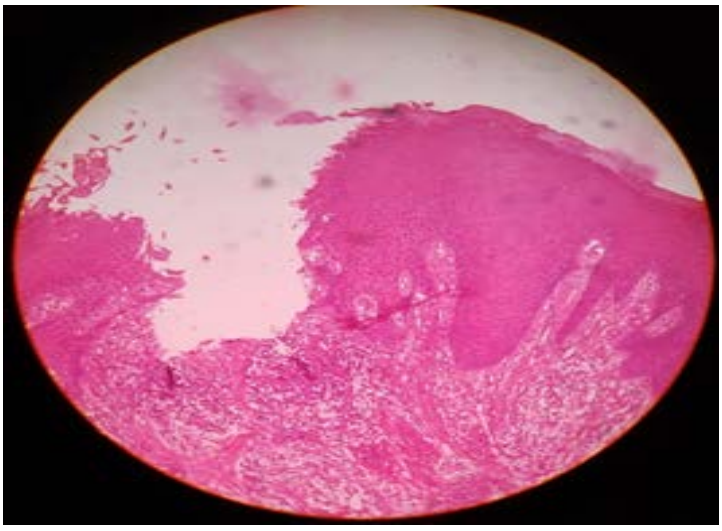

Figure 9

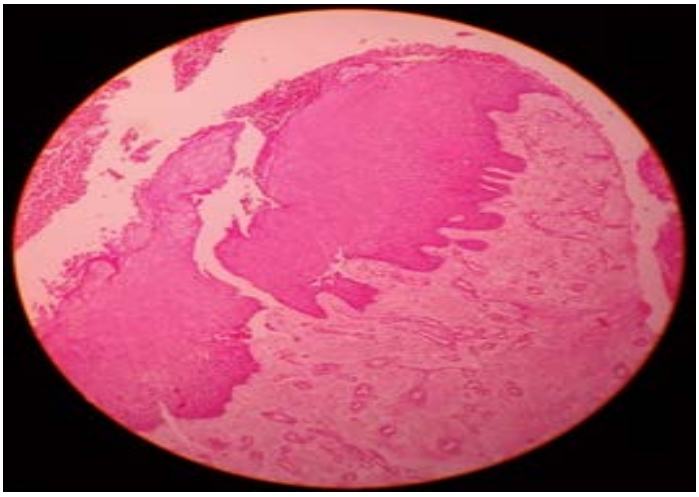

Figure 10

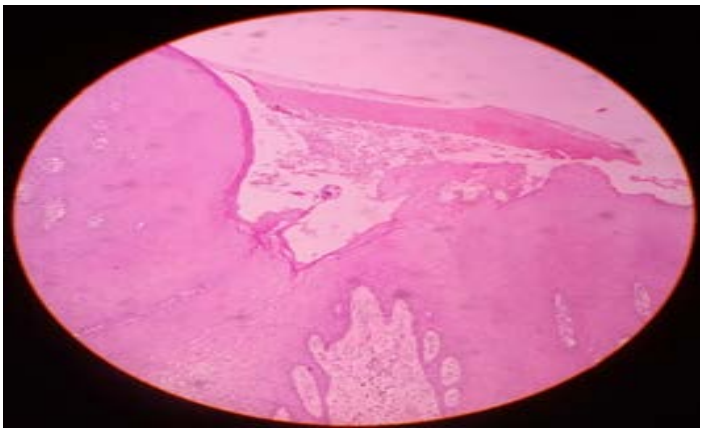

Figure 11

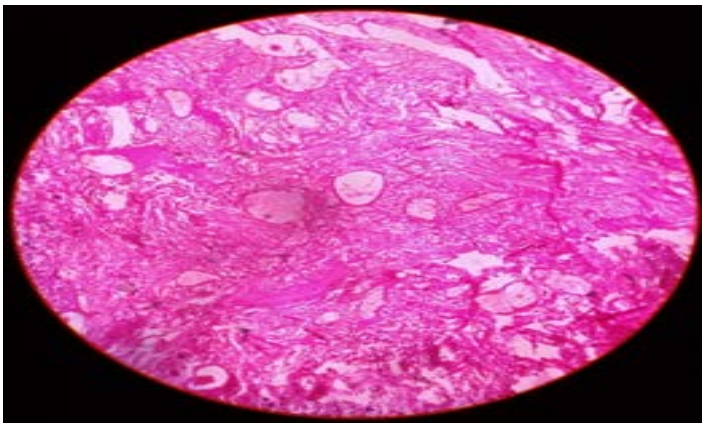

Figure 12

**Discussion**

**Etiologic factors**

Pyogenic granuloma is caused by a known stimulant or injury such as calculus or foreign material within the gingival crevice resulting in exuberant proliferation of connective tissue, as suggested by Regezi et al.,[5].

According to Ainamo [7], routine tooth brushing habits cause repeated trauma to the gingiva resulting in irritation and formation of these lesions. Release of variety of endogenous substances and angiogenic factors caused disturbances in the vascularity of the affected area. Some of the other precipitating factors for pyogenic granulomas include ectopic tooth development,[8] occlusal interferences,[9] immunosuppressive drugs such as cyclosporine [10] and trauma caused by healing abutments of implants.

**Etiopathogenesis**

Oral pyogenic granulomas occur in all age groups, children to older adult, but are more frequently encountered in females in their second decade due to the increased levels of circulating hormones estrogen and progesterone [11]. Due to its frequent occurrence in pregnant females' pyogenic granuloma is also called as granuloma gravidarum or pregnancy tumor.[11] Hormonal changes and reaction of plaque bacteria are responsible for pregnancy gingivitis in some pregnant female patients.[15]

In this case series, in all the patients discussed based on numerous etiologies enumerated above[11,15] the probable etiologic factors applicable included the presence of large amounts of calculus due to poor oral hygiene habits, repeated trauma and occlusal interference while eating due to the size and position of the lesion, which was seen in two patients and as described by Ainamo,[7] recurrent trauma occurring during tooth brushing or function with the release of various endogenous and angiogenic factors contributing to the increased vascularity of the lesion. These factors probably contributed to the development of this lesion. Pagliai and Cohen [18] describing pyogenic granulomas in children used the terminology Lobular Capillary Hemangioma (LCH) to describe pyogenic granuloma as a benign, acquired, vascular neoplasm of the skin and mucous membrane. Davies et al.,[19] noted that the fibroblasts in pyogenic granulomas showed increased synthetic activity and presence of intranuclear inclusion bodies suggesting that pyogenic granulomas of the skin arise from disordered growth of the papillary dermis. Bhaskar and Jacoway [17] demonstrated the presence of gram positive and gram-negative bacilli in the superficial areas of the ulcerated form of pyogenic granuloma, rather than the non-ulcerated form suggesting that these organisms could be contaminants from the oral cavity. This probably justifies the inclusion of the term "pyogenic" in pyogenic granuloma. Oral pyogenic granuloma shows prominent capillary growth within a granulomatous mass rather than the real pyogenic organisms and pus, so the term pyogenic granuloma is a misnomer and it is not a granuloma in the real sense. [7,8] The lesions were not ulcerated in any of the above-mentioned cases.

**Clinical features**

Pyogenic granuloma of the oral cavity appears as an elevated, smooth or exophytic, sessile or pedunculated growth covered with red hemorrhagic and compressible erythematous papules, which appear lobulated and warty showing ulcerations and covered by yellow fibrinous membrane.[7,8] The color varies from red, reddish purple to pink depending on the vascularity of the growth. The gingiva, especially the marginal gingiva is affected more than the alveolar part.[20] Besides the gingiva it is also noticed on the lips, tongue or buccal mucosa, affecting the maxilla more than the mandible, the anterior region than the posterior with the buccal surfaces being affected more than the lingual surfaces. The size varies from a few millimeters to several centimeters and it is usually slow growing, asymptomatic, painless growth but at times it grows rapidly. [7,8]

Case 1 presented here showed a medium sized growth localized to the buccal surfaces of the upper left anterior maxilla, case 2 showed growth on the hard palate, case 3 on the palatal surface of left maxillary anterior, case 4 showed generalized growths and case 5 showed small growth associated with the marginal gingiva of right maxillary anterior tooth. All the cases were reddish pink in color, the time duration presented by all the lesion varied right from the time of first incidence and showed gradual increase in size, it had started to bleed intermittently and it also interfered during mastication, in two cases, which prompted the patients to seek treatment. The growth involved the attached gingiva and the marginal gingiva in most of the cases.

**Histopathology**

Histologically, pyogenic granulomas are classified as the LCH type and the non LCH type. [7,16] The LCH type has proliferating blood vessels organized in lobular aggregates, no specific changes such as edema, capillary dilation or inflammatory granulation were noted. The non LCH type consisted of a vascular core resembling granulation tissue with foci of fibrous tissue. The lobular area of the LCH type has a greater number of blood vessels with small luminal diameter than that in a non LCH type of pyogenic granuloma. In the central area of the non LCH pyogenic granuloma a greater number of vessels with perivascular mesenchymal cells non reactive for alpha smooth muscle actin (SMA) is detected as compared with the lobular area of the LCH type pyogenic granuloma, thereby Epivatianos et al., suggested that the LCH and the non LCH pyogenic granulomas have different pathways of evolution.[16] Sato et al.,[17] described most oral pyogenic granulomas as the LCH type histologically. They investigated the relationship of human endothelial receptor tyrosine kinase Tie2 and its expression in the lobular capillary hemorrhage LCH type pyogenic granulomas and that the expression of Tie2 in the ovoid cells with the presence of alpha SMA antibodies played an important role in the development and progression of the LCH type of pyogenic granulomas. Yuan et al. [13] suggested the etiology of pyogenic granuloma to be due to an imbalance between the angiogenesis enhancers vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF) and angiogenesis inhibitors angiostatin and thrombospodin1. Vascular morphogenesis factors Tie2, angiopoietin 2, ephrin B2 and ephrin were found to be up-regulated in oral pyogenic granulomas. Bhaskar and Jacoway [17] described pyogenic granuloma as covered with parakeratotic or nonkeratinized stratified squamous epithelium. Histopathologically all the cases had similar presentations. Hematoxylin and eosin stained multiple bit of soft tissue sections showed parakeratinized stratified squamous epithelium of varying thickness with areas of denudation. The underlying connective tissue showed presence of loose collagenous stroma, along with endothelial proliferation and thickened capillaries and arterioles. Mild inflammatory cells infiltrate, hemorrhage, fibrinous exudates and foci of calcification was also evident from tissue section. All of the above features pointed towards the confirmatory diagnosis oral pyogenic granuloma of the LCH type as described.

**Radiographic findings**

Radiographic findings are usually absent. However, Angelopoulos [4] concluded that in some cases long standing gingival pyogenic granulomas caused localized alveolar bone resorption. In all the cases described above, there were no obvious radiographic findings.

**Differential diagnosis**

Differential diagnosis included peripheral giant cell granuloma, peripheral ossifying fibroma, metastatic cancer, hemangioma, pregnancy tumor, conventional

granulation tissue hyperplasia, Kaposi's sarcoma, bacillary angiomatosis and non Hodgkin's lymphoma.

**Treatment**

Excision and biopsy of the lesion is the recommended line of treatment unless it would produce a marked deformity and in such a case incisional biopsy is recommended. Conservative surgical excision of the lesion with removal of irritants such as plaque, calculus and foreign materials is recommended for small painless non bleeding lesions. Excision of the gingival lesions up to the periosteum with through scaling and root planning of adjacent teeth to remove all visible sources of irritation is recommended.[7] In the present case series, all the lesions were surgically excised and were sent for histopathologic examination. The scaling and root planning of the adjacent teeth was completed to remove all the local irritants, which could have been the primary etiologic factor in the present case.[8] Various other treatment modalities such as use of Nd: YAG laser, carbon dioxide laser, flash lamp pulse dye laser, cryosurgery, electrodessication, sodium tetradecyl sulfate sclerotherapy and use of intra lesional steroids[17] have been used by various clinicians. Treatment of oral pyogenic granulomas during pregnancy would depend on the individual case and ranges from preventive measures such as careful oral hygiene, removal of dental plaque and use of a soft toothbrush.[18] Wang recommended control of bleeding by desiccation of bleeders, firm compression of the lesion, use of blood transfusions in a case of severe bleeding from a pregnancy tumor and in rare cases termination of pregnancy due to uncontrollable eclampsia have been documented.[19] In some cases shrinkage of the lesion after pregnancy may make surgical treatment unnecessary. In pregnant females recurrence of oral pyogenic granuloma is common so treatment should be preferably performed after parturition. However, if necessary treatment can be completed in the second trimester with follow up of the cast post parturition.[20]

**Recurrence**

Incomplete excision, failure to remove etiologic factors or repeated trauma contributes to recurrence of these lesions. Need of followup, especially in pyogenic granuloma of the gingiva due to its much higher recurrence rate is mandatory. In the present case series only one lesion showed recurrence after one month of initial surgical excision. The lesion of re-excised and all the local irritating factors were removed. Thereafter in the subsequent follow ups no recurrence was documented.

**Conclusion**

Pyogenic granuloma is a common lesion of the skin and oral cavity, especially the gingiva. This case series presents cases of gingival pyogenic granuloma in patients giving an insight into its erratic etiologies, clinical features, histological presentations, treatment modalities and recurrence rates and describes how the diagnosis and treatment of all the cases were completed and followed up for a period of 1 year. The article also highlights that though the term pyogenic granuloma is frequently used it is not associated with pus and histologically resembles angiomatous lesion rather than granulomatous lesion indicating that the term "pyogenic granuloma" is a misnomer.

**References**

1. Dilley DC, Siegel MA, Budnick S. Diagnosis and treatment of common oral pathologies. Pediatric Clinic of North America.
2. Baran S. Oval Patoloji. Ankara: Gazi University si Basimevi, 1983: 235−249.
3. Chin DC. Treatment of maxillary hemangioma with a sclerosing agent. Oval Surgery, Oral medicine, Oral Pathology 1983; 55(3): 247−249.

4. Braun IF, Levy S, Hor man J. The use of trans arterial microembolization in the management of hemangiomas of the perioral region. Journal of Oral and maxillofacial Surgery 1985; 43: 239−242.
5. Regezi JA, Sciubba J. Oval Pathology. Philadelphia: UB Saunders Co., 1993: 136−138.
6. Carranza FA. Glickman's Clinical Periodontology. Philadelphia: UB Saunders Co., 1990**:** 335−351.
7. Ainamo J. The effect of habitual tooth cleansing on the occurrence of periodontal disease and dental caries. Suom Hammaslaak Toim 1971; 67:63-70.
8. Milano M, Flaitz CM, Bennett J. Pyogenic granuloma associated with aberrant tooth development. Tex Dent J 2001; 118:166-72.
9. Widowati W, Ban T, Shareff A. Epulis and pyogenic granuloma with occlusal interference. Maj Ked Gigi 2005; 38:52-5
10. Bachmeyer C, Devergie A, Mansouri S, Dubertret L, Aractingi S. Pyogenic granuloma of the tongue in chronic graft versus host disease. Ann Dermatol Venereol 1996; 123:552-4.
11. Ojanotko Harri AO, Harri MP, Hurttia HM, Sewón LA. Altered tissue metabolism of progesterone in pregnancy gingivitis and granuloma. J Clin Periodontol 1991; 18:262-6.
12. Hosseini FH, Tirgari F, Shaigan S. Immunohistochemical analysis of estrogen and progesterone receptor expression in gingival lesions. Iran J Public Health 2006; 35:38-41.
13. Yuan K, Jin YT, Lin MT. Expression of Tie2, angiopoietin1, angiopoietin2, ephrinB2 and EphB4 in pyogenic granuloma of human gingiva implicates their roles in inflammatory angiogenesis. J Periodontal Res 2000; 35:165-71.
14. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and Maxillofacial Surgery. 2nd ed. Philadelphia: Saunders; 2002. p. 447-9
15. Sooriyamoorthy M, Gower DB. Hormonal influences on gingival tissue: Relationship to periodontal disease. J Clin Periodontol 1989; 16:201-8.
16. Jafarzadeh H, Sanatkhani M, Mohtasham N. Oral pyogenic granuloma: A review. J Oral Sci 2006; 48:167-75.
17. Bhaskar SN, Jacoway JR. Pyogenic granuloma – Clinical features, incidence, histology, and result of treatment: Report of 242 cases. J Oral Surg 1966; 24:391-8.
18. Pagliai KA, Cohen BA. Pyogenic granuloma in children. Pediatr Dermatol 2004; 21:10-3.
19. Davies MG, Barton SP, Atai F, Marks R. The abnormal dermis in pyogenic granuloma. Histochemical and ultrastructural observations. J Am Acad Dermatol 1980; 2:132-42.
20. Mubeen K, Vijaylakshmi KR, Abhishek RP. Oral pyogenic granuloma with mandible involvement: An unusual presentation. J Dent Oral Hyg 2011; 3:6-9.