

PYOGENIC GRANULOMA - REVIEW

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ABSTRACT

Pyogenic granuloma is a common non-neoplastic soft tissue growth seen on a variety sites in the body including the oral cavity. It may also occur in pregnant subjects and is referred to as a granuloma gravidarum. Although the precise etio-pathogenesis is not established, it is regarded as a reactive lesion secondary to trauma or non-specific local irritation. Hormonal stimulation during puberty, pregnancy or oral contraceptive use may also be responsible. A variety of angiogenic factors may mediate exuberant endothelial proliferation. Mostly commonly it affects adolescents and young adults with preponderance in females. The most familiar site is anterior maxillary gingivae but may also affect the mandibular gingivae, lips, tongue and buccal mucosa. Conservative surgical excision is usually curative but recurrence is not unusual. Lasers and cryotherapy may also be employed. Granuloma gravidarum, however, is best left untreated until parturition.

Key words: *Pyogenic granuloma, pregnancy tumor, gingiva*

INTRODUCTION

Pyogenic granulomas are common non-neoplastic, localized, soft tissue growths'. The term pyogenic granuloma is a misnomer as it neither represents infection with pyogenic micro-organisms nor it is a true granuloma² However, the term has been retained in the literature because of its historic significance.

The term "Pregnancy tumor" ("Granuloma gravidarum, "Epulis gravidarum")) refers to a pyogenic granuloma occurring in the pregnancy. Such lesions usually develop during the first trimester and their incidence rises up through the seventh month of pregnancy. Nevertheless, there is no clinical or histopathologic difference between pregnancy granuloma and pyogenic granuloma that occurs in "non-pregnant" patients'

Pyogenic granulomas are not exclusive to the oral cavity but are also seen on other sites in the head and neck region, trunk and extremities⁴.

This paper reviews the etio-pathogenesis, clinical features, microscopic picture, management principles and controversies in pyogenic granuloma.

ETIOLOGY AND PATHOGENESIS

The exact etiopathogenesis of oral pyogenic granuloma is not known. At present it is regarded as an endothelial proliferation of unknown cause

However, there is evidence that pyogenic granulomas result from non-specific local irritation or trauma. Possible factors include:

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- 1) Poor oral hygiene and compromised periodontal health²
- 2) Dental injuries⁵
- 3) Tooth extractions particularly third molars⁶
- 4) Microtrauma due to tooth brushing⁷
- 5) Trauma from orthodontic appliances⁸

Hormonal influences during puberty⁹ pregnancy^{10,11} and the use of oral contraceptives^{12, 13} have also been implicated.

Pyogenic granuloma has also been documented as a manifestation of graft v/s host disease after allogeneic bone marrow transplantation¹⁴.

Recent research has implicated the role of angiogenic factors derived from macrophages in the rapid growth of pyogenic granulomas. Various angiogenic factors including vascular endothelial growth factor (VEGF)¹⁵ angiopoietin-2 (Ang-2)¹⁶ and a nitric oxide (NO) synthase protein-dependent effector mechanism¹⁷ may be responsible for the rapid angiogenesis seen in pyogenic granulomas.

CLINICAL FEATURES

Oral pyogenic granulomas may develop at any age but are more frequently seen in adolescents and young adults (Fig. 1 and 2). However, lesions may be observed in the elderly (Fig.3). There is a definite female predilection^{18,19}.

Gingival mucosa is the most common site (75%) followed by lips, tongue and buccal mucosa. Gingival lesions have been reported to be more frequent more in the maxilla with the anterior region of both jaws being more commonly involved". (Fig.4,5, and 6). Most gingival lesions involve the labio-buccal gingivae initially but may encroach on the lingual / palatal gingivae later.

Pyogenic granuloma presents as a solitary lobulated or smooth mass, which is usually pedunculated. The colour of the lesion varies from red / purple (early) or pink (old).

Pyogenic granulomas are usually painless except for mild tenderness but tend to bleed frequently (during eating/tooth brushing) causing distress to the patients. They usually range from a few mm to several cm in size. Pyogenic granulomas may exhibit rapid growth creating a pseudo impression of a more aggressive

lesion or even malignancy. Untreated lesions may undergo fibrous maturation and the tendency to bleed may become less frequent.

HISTOPATHOLOGIC FEATURES

The lesion shows exuberant proliferation of a highly vascular elements simulating granulation tissue. The endothelial-lined vascular channels are engorged with erythrocytes. The vascular channels are composed of capillary sized vessels arranged in lobules and this characteristic arrangement is the basis to designate pyogenic granuloma as "Lobular capillary hemangioma" (LCH)²¹

The vascular channels are supported by a loose connective tissue stroma which shows a mixed inflammatory cell infiltrate with a predominance of neutrophils and histiocytes. The mitotic figures within the lesion are normal. The overlying epithelium usually shows areas of ulceration with a fibrinopurulent exudate on the surface.

Fibrous tissue becomes more prominent in untreated, mature lesions concomitant with a reduction in vascularity. This change is depicted clinically as transformation of a pyogenic granuloma into a fibroma.

TREATMENT AND PROGNOSIS

Conservative surgical excision with a scalpel is the treatment of choice and is usually curative. Alternatively electrocautery may be used to remove oral lesions in order to minimize bleeding. For lesions involving the gingival / alveolar mucosa, excision down to the periosteum is advised¹². Scaling and polishing of adjacent teeth is recommended to eliminate any local irritation. Occasionally recurrences are reported and require re-excision. Nevertheless, prognosis for intra-oral pyogenic granulomas is good.

Satisfactory outcome has been reported with Laser therapy^{22,23} and Cryosurgery²⁴ for oral pyogenic granulomas. Interestingly, multiple recurrences of intraoral pyogenic granuloma have been reportedly treated with intra-lesional corticosteroids by some²⁵

Lesions in pregnant subjects may require a more conservative approach and since many lesions resolve spontaneously after parturition, surgical intervention is not warranted during pregnancy unless causing significant problems. Moreover, the recurrence rate is reported to be higher for lesions removed during pregnancy probably due to the persisting hormonal influences.



Fig 1. Pyogenic Granuloma in a 10 year male



Fig 2. Granuloma Gravidarum in a 26 year female



Fig 3. Pyogenic Granuloma in a 58 year edentulous male



Fig 4 Pyogenic Granuloma in a 30 year female



Fig 5 (a) Granuloma Gravidarum in a 22 year old female



Fig. 5 (b) The excised specimen



Fig 6 (a) Pyogenic Granuloma in a 49 year male



Fig 6 (b) Gingival dressing in situ after excision



Fig 6 (c) Excised specimen



Fig 6 (d) Healing 10 days post-excision

DISCUSSION

All lesions should be submitted for histopathology to rule out more serious diseases since primary as well as metastatic malignancies^{26,27,28} may present as pyogenic granulomas. Moreover, peripheral odontogenic tumors may also clinically simulate pyogenic granulomas²⁹

The use of intra-lesional corticosteroids for multiple recurrences seems questionable since substantial evidence supporting this option is lacking. Therapy with the pulsed-dye laser at vascular-specific 585 nm is very selective, usually requires no anesthesia, and produces excellent cosmetic results³⁰. Therefore, laser therapy may offer more promise in recurrent / multiple lesions but requires further clinical trials.

Pyogenic granulomas may be seen in up to 5% of pregnancies³¹. The high rate of occurrence of pyogenic granuloma in pregnant subjects warrants a thorough oral examination of all pregnant subjects since gynecologists and obstetricians are less familiar with this condition³²

Unfortunately, a large number of intra-oral pyogenic granulomas are treated by otolaryngologists world-wide³³ which does not seem to be justified because of a relatively poor understanding of oral disease processes and identification of local irritants. Therefore, it is suggested that all intra-oral pyogenic granulomas may preferably be treated and followed —up in oral and maxillofacial surgery clinics.

CONCLUSIONS

Oral pyogenic granulomas are fairly common lesions and are most frequently seen on the maxillary gingivae and in pregnant subjects. Conservative surgical excision is usually curative. However, the tendency to remove these lesions during pregnancy must be resisted.

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