

Pyogenic Granuloma - Hyperplastic Lesion in Gingival Tissue: A Case Report

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Abstract

Reactive hyperplasia of connective tissue caused by local irritants is known as pyogenic granuloma. It is a tumor-like development of the oral cavity that is thought to be neoplastic in nature. It is often found around the anterior teeth or skin. It usually occurs as a result of a variety of stressors, including low-grade local irritation, severe damage, hormonal factors, or certain medications. Histologically, the surface epithelium may display foci of ulcerations, and hyperkeratosis, or may remain intact. It sits on top of a thick connective tissue mass that contains a substantial proportion of fully grown collagen. The most often impacted area is the gingiva, which is followed by the lips, tongue, and buccal mucosa. Pyogenic granuloma generally does not develop when the base and its contributing variables are removed. This paper presents some cases of a pyogenic granuloma managed by surgical intervention.

Introduction

Localized hyperplastic lesions of the gingiva, commonly known as "epulides," have been recognized for generations. The term 'epulis' is derived from the Greek words "epi" and "elon," meaning 'on the gingiva.' Thus, it can logically be used to describe the clinical appearance of any lesion on the gingiva. However, this term does not provide any information about the nature of the lesion.^{1,2}

The term "pyogenic granuloma" is misleading because the lesion neither contains pus nor is it technically a granuloma. About one-third of these lesions result from trauma, and poor oral hygiene can also be a contributing factor. It typically appears as a painless, pedunculated, or sessile mass on the gingiva.

Pyogenic granuloma is the most prevalent of all oral tumor-like growths. Although the term suggests a benign neoplasm, most fibromas are actually reactive focal fibrous hyperplasias caused by trauma or local irritation. While "focal fibrous hyperplasia" is a more accurate description of its clinical appearance and pathogenesis, this term is not widely used.

Pyogenic granuloma is a highly active, benign inflammatory lesion that predominantly occurs on the mucosa of females with elevated levels of steroid hormones. It is widely believed that female sex hormones play a significant role in its development.³

It is a tumor-like growth of the oral cavity, often found around the anterior teeth, or on the skin, and is considered to be neoplastic in nature.⁴ It usually arises in response to various stimuli such as low-grade local irritation⁵, traumatic injury, hormonal factors⁶, or certain kinds of drugs⁷

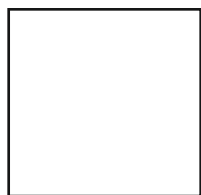
Case 1

A 26-year-old male patient visited the Department of Periodontology at Inderprastha Dental College and Hospital, complaining of pain and swelling in the gums of the upper front tooth region for the past 2-3 months, which had been gradually increasing in size. Clinical examination revealed a localized gingival swelling measuring 1.5 cm by 1 cm, displaying clear signs of inflammation around teeth 15 and 16 (Fig. 1). The swelling was a smooth, exophytic lesion, appearing as a small erythematous papule on a pedunculated base, which bled spontaneously upon probing (Fig. 2). The lesion was painless and asymptomatic, except for slight discomfort caused by the growth.

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Fig 1- Pre-operative



Fig 2- Pre-operative (Lateral View)

Physical examination revealed no other abnormalities, and there was no cervical lymphadenopathy. The patient had moderate supragingival and subgingival calculus accompanied by moderate gingivitis. His medical history was unremarkable. Based on these observations, a provisional diagnosis of pyogenic granuloma was made, and an excisional biopsy was planned. Initially, conventional non-surgical therapy was performed, including full-mouth scaling and root planing. There was severe bleeding during the scaling and curettage, which ceased within a few minutes after applying pressure with gauze.

The patient was instructed to maintain oral hygiene by brushing twice a day and using a 0.2% chlorhexidine mouth rinse twice daily. Over the following two weeks, a gradual reduction in the growth was observed. Subsequently, a surgical approach was chosen to further treat the lesion. After administering local anesthesia, the enlarged localized lesion was excised with a No. 15 B.P. blade down to its base (Fig. 3). Care was taken to completely remove the lesion by trimming the adjacent soft tissue to prevent recurrence. Following the excision, a periodontal dressing was applied to protect the wound from trauma and to promote healing for one week.



Fig 3 - After Excision



Fig 4 - Excised Tissue

Antibiotics and analgesics were prescribed for one week. The excised tissue was sent for histological examination (Fig. 4), which confirmed the diagnosis of pyogenic granuloma. The patient was scheduled for monthly checkups. After four weeks, there was no visible regrowth; the lesion had been completely eliminated (Fig. 5). Supportive periodontal maintenance was recommended every three months to maintain periodontal health and re-evaluate the area. There was no recurrence even after six months. Additionally, the patient was referred for a periodontal bone grafting procedure to manage bone loss and subsequently for orthodontic treatment for malaligned teeth.



Fig 5- Post-operative (1 Month)

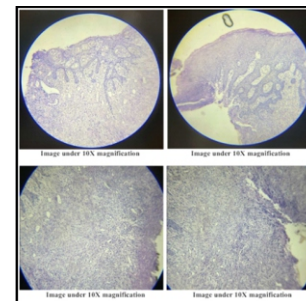


Fig 6 – Histologic Slide

Case 2

A 50-year-old female patient visited the Department of Periodontology at Inderprastha Dental College and Hospital, complaining of a swelling on her gums in the upper front region of her jaw that had persisted for three months (Fig. 7). Clinical examination revealed a localized gingival swelling measuring 2 cm by 1 cm with clear signs of inflammation near teeth 23 and 24. The lesion was firm in consistency and bled upon probing.



Fig 7 - Pre- Operative



Fig 10 – Post- Operative

The patient's medical history was unremarkable. Initially, full-mouth scaling and root planing were performed. After about 10 days, once the inflammation had reduced, surgery was scheduled to excise the lesion. Following local anesthesia, the lesion was excised with a No. 15 B.P. blade down to its base (Fig. 8). To ensure complete removal and prevent recurrence, a laser gingivectomy was also performed to eliminate any remaining cells (Fig 9). A periodontal dressing was then applied for one week. Antibiotics and analgesics were prescribed for five days. The patient was monitored weekly postoperatively to maintain good oral hygiene in the surgical area (Fig. 10). At the six month follow-up, the gingival tissues were healthy with successful healing and no recurrence.



Fig 8 - Excised Tissue



Fig 9 - Laser Gingivectomy

Discussion

Pyogenic granuloma is an inflammatory hyperplasia affecting the oral tissues. The first likely report of pyogenic granuloma in English literature was by Hullihen in 1844. However, it wasn't until 1904 that Hartzell introduced the term "pyogenic granuloma."⁸ It is now universally accepted that this lesion results from an exaggerated localized connective tissue reaction to a minor injury or underlying irritation.⁹ There can be various irritating factors such as plaque and calculus, cheek biting, overhanging restorations. It can also be caused due to hormonal changes in women during puberty, pregnancy and in menopausal phase. Certain medications, such as cyclosporine, may also contribute to the development of pyogenic granuloma.^{10,11} Pyogenic granuloma is rarely found on the hard palate. More than 75% of reported cases occur on the gingiva, with a preference for the interdental papilla region.^{10,11,12} This pathology is more common in the second and third decades of life and affects more women than men, with an average age of 52 years.¹² The prevalence of pyogenic granuloma in pregnant women ranges from 5% to 8%, most commonly appearing after the first trimester.^{10,12,13} It is considered a hormone-dependent lesion, as high levels of sex hormones (estrogen and progesterone) stimulate the expression of angiogenic factors in inflammatory tissues. Clinically, pyogenic granuloma (PG) typically appears as a painless, pedunculated or sessile asymptomatic mass with a smooth or lobulated surface. It is soft in consistency and ranges in color from red to purple, bleeding with minimal contact. The lesion may ulcerate and develop a fibrinopurulent covering. Its size can range from a few millimeters to a few centimeters. While the growth of PG is generally slow, it can occasionally experience rapid growth spurts.^{10,14,15}

Histologically, pyogenic granuloma (PG) can appear in two forms: lobular and non-lobular. The lobular form is characterized by a larger number of proliferating blood vessels with minimal specific changes. The non-lobular form is marked by the presence of dilated capillary channels lined with endothelial cells.¹² The connective tissue is fibrous and frequently edematous. Inflammatory cells such as polymorphonuclear neutrophils, lymphocytes, and plasma cells are observed. Occasionally, there may be an epithelial cuff underlying the lesion. The histological appearance of pyogenic granuloma (PG) varies due to its inflammatory characteristics. Over time, it can become more mature, less

vascularized, and collagen-rich, eventually resembling a fibrous epulis.^{10,12} Histologically, the tumor resembles more of a granulomatous lesion rather than a pyogenic one. Nevertheless, the term "pyogenic granuloma" is widely accepted and used in practice, and attempting to change it could potentially cause confusion.^{11,13}

The treatment of pyogenic granuloma typically requires complete surgical removal. Recurrence after excision is a recognized complication but can be mitigated. The recurrence rate for pyogenic granuloma is reported to be 16% for treated lesions, necessitating potential re-excision. Differential diagnosis from other benign soft tissue lesions such as peripheral giant cell granuloma, pregnancy tumor, and conventional granulation tissue is important.⁸

Effective treatment and favorable prognosis are facilitated by accurate diagnosis and appropriate management. Histologically, the surface epithelium may appear intact, show areas of ulceration, or even exhibit hyperkeratosis. Beneath this, there is a dense mass of connective tissue rich in mature collagen. Pyogenic granuloma can be successfully managed with proper diagnosis and treatment planning. Careful management of the lesion is also essential to prevent recurrence of this benign condition.

Conclusion

From the findings presented in this paper, it can be inferred that a combination of different causative factors possibly contributed to the transformation of regular gingivitis into granuloma formation. The lesion was painless, as nerves typically do not proliferate within reactive hyperplastic tissue. Surgical excision proves effective in reducing the likelihood of lesion recurrence. Therefore, emphasis should be placed on accurate diagnosis and appropriate treatment planning. Careful management of the lesion is crucial while aiming to preserve and enhance the mucogingival complex.

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