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Diagnostic Challenges of Pyogenic Granuloma: A Retrospective Review

BY

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Abstract

Background: *Pyogenic granuloma (PG) is a benign, hyperplastic vascular lesion frequently found in the oral cavity. It often mimics other lesions such as peripheral giant cell granuloma and hemangioma, making clinical diagnosis challenging. Accurate diagnosis is essential to avoid mismanagement, emphasizing the need for histopathological examination. This study aims to retrospectively analyze the clinical and histopathological features of PG, highlighting the diagnostic challenges in distinguishing it from other similar oral lesions.*

Materials and Methods: *A retrospective review of 70 cases of PG diagnosed between 2017 and 2024 was conducted. Data collected included patient demographics, clinical presentation, provisional diagnosis, histopathological findings, and treatment modalities. Cases were categorized based on provisional and histopathological diagnoses, and descriptive statistics were applied.*

Results: *PG was most prevalent in the 31-40-year age group (27.1%). The mandibular alveolar mucosa was the most common site (54%). Only 38.6% of cases provisionally diagnosed as PG were histopathologically confirmed, while 38.6% were misdiagnosed. 22.9% of cases provisionally diagnosed as other lesions were confirmed as PG. Excisional biopsy was performed in 87.1% of cases, while incisional biopsy was used in larger or more suspicious lesions (12.9%).*

Conclusion: *PG poses significant diagnostic challenges due to its clinical similarity to other lesions. Histopathological confirmation is crucial for accurate diagnosis. Excisional biopsy is the preferred treatment, with incisional biopsy reserved for larger lesions or where malignancy is suspected. Careful diagnosis and management are essential to reduce recurrence and ensure optimal patient outcomes.*

Keywords: *Pyogenic granuloma, histopathological diagnosis, excisional biopsy, diagnostic challenges, oral lesions.*

Introduction

Pyogenic granuloma (PG) is a benign, vascular lesion that can occur in a wide range of sites. In the oral cavity, gingiva is the common site. Despite its name, PG is neither a true granuloma nor associated with pus formation; rather, it represents a hyperplastic response of the vascular tissue, often triggered by minor trauma, chronic irritation, or hormonal influences. They are also known as granuloma pediculatum benignum, benign vascular tumor, septic granuloma, hemangiomatous granuloma, vascular epulis, fibroangioma, polypoid capillary hemangioma, telangiectatic granuloma, eruption capillary hemangioma, non-lobular capillary hemangioma, and Crocker and Hartzell's disease [1]. When it occurs in the oral mucosa during pregnancy, it is referred to as granuloma gravidarum, granuloma of pregnancy, or epulis gravidarum. Clinically, PG presents as a rapidly growing, erythematous nodule, which can vary in size from a few millimeters to several centimeters, but are rarely larger than 2.5 centimeters and may cause discomfort or functional impairment [2]. Histologically, PG is characterized by proliferation of capillaries and inflammatory cell infiltrate in an edematous stroma suggesting a reactive phenomenon. PG has a high recurrence rate when

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incompletely excised or when etiological factors like local irritants or hormonal changes are not addressed [3]. Although benign, its rapid growth and vascular nature may lead to bleeding, especially when located in areas prone to trauma or where esthetics are important, such as the anterior gingiva.

Accurate diagnosis is critical as PG to mimic other, more serious oral lesions such as oral squamous cell carcinoma. The differentiation of PG from other oral lesions is essential for appropriate treatment and prognosis. The variability between clinical and histopathological diagnoses highlights the diagnostic challenges associated with the lesion. In this study, we retrospectively analysed the clinical and histopathological features of PG in order to better understand the diagnostic challenges associated with this lesion and provide insights that can aid in improving clinical accuracy for better management of PG cases.

Materials and Methods

This retrospective review was conducted on cases of PG from the archives Of oral and Maxillofacial Pathology Department between 2017 and 2024. Data collection involved the examination of clinical records, histopathological reports to assess trends in the presentation, diagnosis, and management of pyogenic granuloma.

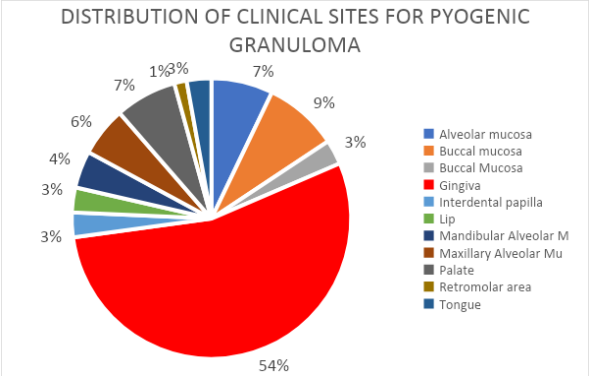
Cases included in the study were selected based on the following criteria: (1) provisional clinical diagnosis of pyogenic granuloma, (2) histopathological diagnosis of pyogenic granuloma, and (3) cases initially diagnosed as other lesions but diagnosed histopathologically as pyogenic granuloma. Exclusion criteria included lack of sufficient information. A total of 70 cases (N=70) met the inclusion criteria and were included in the review.

Patient demographics such as age, gender, and relevant medical history, which provided context for each case were retrieved. The clinical presentation of each lesion was documented, detailing the site of the lesion, its size, and the duration of symptoms prior to diagnosis. The initial clinical diagnosis, or provisional diagnosis, was recorded based on the lesion's presentation. This was later compared to the histopathological diagnosis, which was confirmed through histopathological examination of biopsy specimens. The type of treatment modality used, whether surgical excision, laser therapy, or other adjunctive procedures, was also documented. Descriptive statistics were used to summarize demographic data and clinical features. The accuracy of provisional diagnoses was assessed by comparing them with the histopathological diagnosis.

Results

A total of 70 cases are categorized into six age groups. The highest proportion of cases (27.1%) falls in the 31-40 years age group, with 19 individuals. This was followed by the 41-50 years group, which accounts for 20% of the cases (14 individuals). The 51-60 years group has 12 cases, representing 17.1% of the total, while the > 60 years group contains 10 cases (14.3%). The 21-30 years group holds 9 cases, making up 12.9% of the total, and the < 20 years group has the smallest number of cases with 6 individuals, representing 8.6%.

The gender distribution in the sample of 70 participants consists of 36 (51,4%) males and 34 females, accounting for 48.6%. The distribution of lesions across various oral sites were analyzed and majority of lesions are located in the mandibular alveolar mucosa, accounting for 54% of the cases. Other notable sites include the gingiva and the maxillary alveolar mucosa and are shown in graph 2.



Of the total cases that were received for histopathological analysis between 2017 and 2024, PG constituted 70(6%) of the total cases, while the remaining 1165 (94%) cases represent other conditions or diagnoses.

The distribution of histopathological diagnoses based on provisional diagnosis categories (N=70) given in Table 1 reveals that 27 (38.6%) cases were provisionally diagnosed as PG and were confirmed as PG histopathologically. Similarly, another 27 (38.6%) cases were provisionally diagnosed as PG but were histopathologically diagnosed with other conditions. 16 (22.9%) of the cases which were provisionally diagnosed with other conditions but were confirmed as PG histopathologically.

Pertaining to categorization of cases based on provisional and histopathological diagnoses, 27 (38.6%) cases were provisionally diagnosed as PG and were confirmed as PG histopathologically. Similarly, another 27 (38.6%) cases were provisionally diagnosed as PG but were found to be histopathologically different from PG. Additionally, 16 (22.9%) were provisionally diagnosed as conditions other than PG but were histopathologically confirmed as PG.

In terms of biopsy, 61(87.1%) of the cases were treated by excisional biopsy, and 9(12.9%) of the cases were subjected to incisional biopsy, due to factors such as extensive size of the lesion 4(45%) cases or provisional diagnoses that suggested an aggressive lesion such as oral squamous cell carcinoma 3(33%) cases. Additionally, incisional biopsies were performed in cases of generalized gingival hyperplasia 1(11%) and suspected fungal infection in 1(11%) case.

Discussion

The differential diagnosis of PG can be challenging because it shares clinical features with a variety of other oral lesions. Conditions such as peripheral giant cell granuloma, peripheral

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ossifying fibroma, and hemangioma may present similarly with red, vascular, or proliferative appearances. Accurate diagnosis often requires histopathological examination, as visual characteristics alone may not suffice. Misidentification can lead to inappropriate treatment, so recognizing subtle differences in morphology and conducting a biopsy are crucial steps in distinguishing PG from other conditions. The present retrospective study represents our experience with diagnostic challenges associated with PG in the oral cavity.

The demographic data of the cases analyzed shows a peak occurrence of PG in the 31-40-year age group (27.1%). This finding aligns with previous studies suggesting that PG commonly affects individuals in their third and fourth decades of life [4], indicating hormonal cause, increased exposure to irritants, and an accumulation of local irritants like plaque and calculus in this age group [5]. There was a slight male predilection 51.4%, though most literature females have a higher prevalence due to hormonal factors such as pregnancy or use of oral contraceptives [1].

The mandibular alveolar mucosa was the most commonly affected site (54%), the gingiva and maxillary alveolar mucosa (7% each), particularly the gingiva which could be attributed due to trauma, plaque accumulation, and irritation from dentures or other dental appliances [6,7].

Only 38.6% of the cases provisionally diagnosed as PG were confirmed histopathologically. This highlights the importance of clinical differential diagnosis with lesions such as peripheral giant cell granuloma or peripheral ossifying fibroma [8]. This highlights the importance of histopathological examination for definitive diagnosis, ensuring proper treatment planning and patient management. Interestingly, 22.86% of cases that were provisionally diagnosed as other conditions were histopathologically confirmed as PG. The histopathological findings emphasize the importance of recognizing the different phases in the development of PG, as described by Sternberg et al [9]. The varying appearances of PG in its early, capillary, and involutionary phases can complicate clinical diagnosis, often leading to confusion with other vascular lesions like peripheral giant cell granuloma or peripheral ossifying fibroma. This reinforces the need for histopathological confirmation, as the overlapping clinical features during the different phases of PG development may contribute to the high rate of misdiagnosis observed in this study.

A large proportion of cases 87% were managed with excisional biopsy, which not only serves as a diagnostic procedure but also as a treatment modality, ensuring complete removal of the lesion. This approach is particularly advantageous in smaller lesions < than 1 cm given the benign nature of PG, where recurrence is often minimized with complete excision. In contrast, incisional biopsies were performed in a smaller subset of cases 12.9% due to the extensive size of the lesions (> 1 cm) or when the differential diagnosis included OSCC. These findings suggest that while excisional biopsy remains the preferred method for managing PG, incisional biopsy is reserved for cases where the lesion's size or clinical suspicion requires a more conservative approach.

The findings of our study emphasize the critical role of histopathological examination in diagnosing oral lesions, particularly for conditions like PG that can clinically resemble other pathologies. Furthermore, it underlines the importance of clinicians integrating both clinical and histopathological findings in their treatment approach, especially in cases where the lesion's appearance is atypical or when there is significant diagnostic uncertainty. Recurrence of PG is a well-documented concern, often associated with incomplete excision or persistence of etiological factors, such as trauma or irritation. Therefore, careful surgical excision and long-term follow-up are crucial to minimize recurrence rates. The limitation of the study includes its retrospective nature and dependence on clinical records, which may not encompass all pertinent patient history or lesion details. Additionally, while the sample size is sufficient for descriptive analysis, it may limit the broader applicability of the findings. Prospective designs and larger sample sizes to provide deeper insights into the diagnostic processes and outcomes related to PG.

Conclusion

PG presents diagnostic challenges, making histopathological confirmation essential. Excisional biopsy is recommended as the primary management approach in lesions with clinical diagnosis, with incisional biopsy reserved for cases where lesion size or provisional diagnosis suggests higher risk. Accurate diagnosis and tailored management are crucial for improving patient outcomes and reducing misdiagnosis in PG cases.

Figures

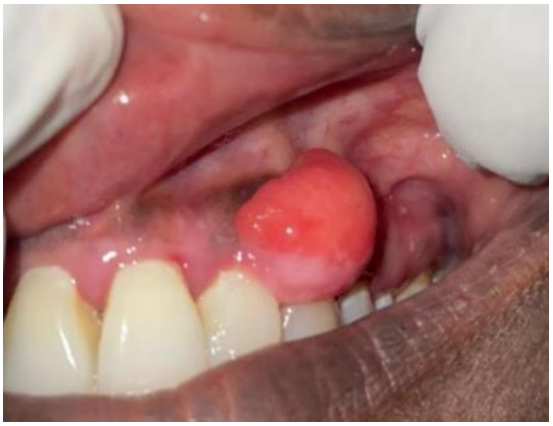

Figure 1: Clinical photo of case that was provisionally diagnosed as pyogenic granuloma but histological diagnosis was Peripheral Ossifying Fibroma

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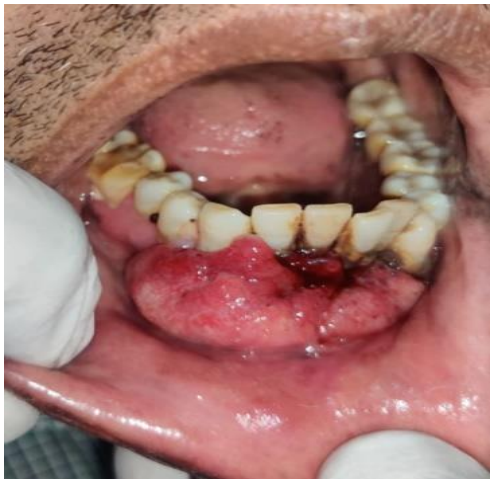

Figure 2: Clinical photo of case that was provisionally diagnosed as PG but histological diagnosis was OSCC

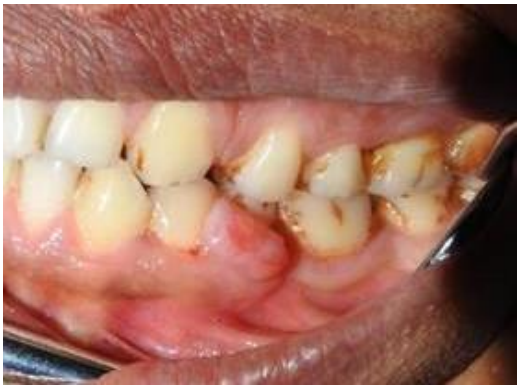

Figure 3: Clinical photo of case that was provisionally diagnosed as Gingival hyperplasia but histological diagnosis was PG

Abbreviations

1. PG – Pyogenic Granuloma
2. OSCC – Oral Squamous Cell Carcinoma

References

1. Kamal R, Dahiya P, Puri A. Oral pyogenic granuloma: Various concepts of etiopathogenesis. J Oral Maxillofac Pathol. 2012;16: 79–82.
2. Gomes SR, Shakir QJ, Thaker PV, Tavadia JK. Pyogenic granuloma of the gingiva: A misnomer? - A case report and review of literature. J Indian Soc Periodontol. 2013;17: 514–519.
3. Al-Noaman AS. Pyogenic granuloma: Clinicopathological and treatment scenario. J Indian Soc Periodontol. 2020;24: 233–236.
4. Koo MG, Lee SH, Han SE. Pyogenic Granuloma: A Retrospective Analysis of Cases Treated Over a 10-Year. Arch Craniofac Surg. 2017;18: 16–20.
5. Henry F, Quatresooz P, Valverde-Lopez JC, Piérard GE. Blood vessel changes during pregnancy: a review. Am J Clin Dermatol. 2006;7: 65–69.
6. Verma PK, Srivastava R, Baranwal HC, Chaturvedi TP, Gautam A, Singh A. "Pyogenic granuloma - Hyperplastic lesion of the gingiva: case reports." Open Dent J. 2012;6: 153–156.
7. Silva CA, Fernandes AIB, Louredo BVR, Torres RS, Martins VB, Fujimoto LBM, et al. Pyogenic granuloma in the alveolar mucosa region of the jaw anterior. Oral Surg Oral Med Oral Pathol Oral Radiol. 2023;136: e76.
8. Marla V, Shrestha A, Goel K, Shrestha S. The Histopathological Spectrum of Pyogenic Granuloma: A Case Series. Case Rep Dent. 2016;2016: 1323798.
9. Mills SE, Carter D, Greenson JK, Reuter VE, Stoler MH. Sternberg's Diagnostic Surgical Pathology. Lippincott Williams & Wilkins; 2012.

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