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Unveiling the Enigma of Plasma Cell Granuloma in the Oral Cavity

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Abstract

Plasma cell granuloma, also referred to as inflammatory pseudotumor, is an uncommon benign growth affecting various organs, including the oral cavity. Despite being recognized for many years, it remains relatively poorly understood and diagnosed due to its infrequent occurrence. In this article, we aim to explore the complexities of plasma cell granuloma in the oral cavity, focusing on its clinical manifestation, diagnostic hurdles, and available treatment strategies.

Keywords: NIL

Introduction

Plasma cell granuloma in the oral cavity is a rare and puzzling condition that can affect individuals of all age groups, drawing increased attention from the medical community in recent times. (1) Typically, it presents as a solitary, painless mass characterized by an excessive proliferation of mature plasma cells and an accompanying inflammatory component comprising lymphocytes, histiocytes, and eosinophils. The exact cause of plasma cell granuloma remains uncertain, although various theories have been proposed, including immune responses triggered by trauma, infection, or autoimmune processes. Diagnosing plasma cell granuloma in the oral cavity poses challenges due to its diverse clinical appearance, often resembling other benign or malignant lesions. Hence, clinicians must exercise caution to differentiate it from more serious conditions such as plasma cell neoplasms, lymphoproliferative disorders, and oral carcinoma.(2) Biopsy and histopathological analysis play a pivotal role in establishing an accurate diagnosis, with distinct histological features such as the presence of plasma cells and the absence of nuclear atypia aiding in identification. Treatment approaches for plasma cell granuloma in the oral cavity primarily depend on factors like the size, location, and symptoms of the lesion. Since it is benign, a conservative management approach is generally preferred. Furthermore, regular follow-up is crucial in managing patients with this condition due to its potential for recurrence. A comprehensive understanding of the lesion's behavior and timely intervention can ensure favorable long-term outcomes.

Case Report

A 50-year-old male patient visited the oral and maxillofacial pathology department with a complaint of a persistent non-healing ulcer on the lips for the past year. On examination, he displayed diffuse swelling in the upper and lower lip regions, along with mild hypopigmentation and angular cheilitis, accompanied by crusting. Intraorally, an ulcer was evident at the mouth angle extending to the labial and buccal mucosa. Additionally, there was generalized gingival erythematous inflammation with hyperplasia noted

around teeth 16 and 26, extending posteriorly to the palate's posterior third, with sloughing crossing the midline. The lesion spanned from the buccal mucosa to the occlusal third of the maxillary teeth. Palpation revealed a soft to firm, tender lesion with bleeding upon probing.

Gross examination revealed irregular creamish-white to brown tissue measuring 0.6cm x 0.8cm.

Blood investigations indicated:

Hemoglobin: 8.2 gm%

Bleeding time: 1 minute 35 seconds

Clotting time: 4 minutes 10 seconds

Serum albumin: 4.3 gm/dL

Serum total protein: 8.9 gm/dL

Blood urea: 16.7 gm/dL

Microscopically :

The H&E stained section depicts extensive proliferation of round cells, primarily plasma cells, within sheets of connective tissue. These cells exhibit hyperchromatic nuclei, accompanied by epithelioid cells and interspersed vascularity. Conversely, another portion of the section shows neural tissues alongside chronic inflammatory cells.

Discussion :

Etiology :

Comprehending the etiology of plasma cell granuloma is crucial to understanding its nature. While the precise cause remains uncertain, it's commonly seen as a reactive process rather than a neoplastic one. Factors such as genetic predisposition, prolonged exposure to antigens, and immune system dysregulation are thought to contribute to its formation. (3)

Oral Manifestations :

Clinically, plasma cell granuloma can present as a solitary or multiple lesions, commonly observed on the oral mucosa, gingiva, or tongue. (4)The appearance can be variable, ranging from erythematous to white, and often exhibit a firm or rubbery texture. Although these lesions are generally asymptomatic, they can cause discomfort or interfere with normal oral function, especially if located in areas susceptible to trauma.(5)

Pathogensis :

The emergence of plasma cell granuloma in the oral cavity, also termed as inflammatory pseudotumor, is influenced by various factors. Chronic inflammation, often initiated by issues like poorly fitting dentures, dental procedures, or chronic periodontal disease, plays a pivotal role by fostering an environment conducive to lesion formation. Disruptions in the immune response exacerbate inflammation, involving a range of immune cells such as plasma cells, lymphocytes, and macrophages. (6,7,8)Although rare, genetic predispositions may increase susceptibility to developing plasma cell granuloma in certain individuals. Some research suggests potential involvement of infectious agents like bacteria or viruses in the pathogenesis, although precise mechanisms remain unclear(9,10). Overall, the pathogenesis of plasma cell granuloma in the oral cavity is multifaceted, involving chronic inflammation, immune dysregulation, genetic influences, and possibly infectious agents. Further investigation is warranted to fully elucidate the intricate interactions among these factors in driving the development of this condition.

Diagnosis :

Accurate diagnosis of plasma cell granuloma is crucial for appropriate management. This can be achieved through a combination of clinical examination, radiographic assessment, laboratory investigations, and histopathological analysis(11,12,13). Clinical features alone may not be sufficient to establish an accurate diagnosis, as similar lesions, such as pyogenic granuloma or inflammatory fibrous hyperplasia, can mimic plasma cell granuloma. Imaging techniques, such as computed tomography (CT) or magnetic resonance imaging (MRI), may reveal the extent of the lesion and aid in surgical planning if necessary.However, histopathological examination remains the gold standard for definitive diagnosis. Biopsy specimens demonstrate a proliferation of plasma cells with fibrous connective tissue, devoid of atypia or mitotic figures(14,15,16). Immunohistochemical staining can further confirm the presence of polyclonal plasma cells, thereby ruling out potential malignant entities such as plasmacytoma.Once a diagnosis of plasma cell granuloma has been established, treatment options can be explored.

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Histopathology :

Plasma cell granuloma of the oral cavity is characterized by a dense infiltration of inflammatory cells, including plasma cells, lymphocytes, and macrophages, which can appear either diffusely spread or in nodular formations.(17) Plasma cells, distinguished by their abundant eosinophilic cytoplasm and eccentrically positioned nuclei displaying a clock-face or cartwheel chromatin pattern, are a prominent feature. Concurrently, there is a proliferation of fibroblasts and myofibroblasts, leading to the formation of fibrous tissue. (18) Vascular changes, such as congestion and endothelial proliferation, are commonly observed, along with the presence of granulation tissue characterized by proliferating capillaries and fibroblasts within a loose extracellular matrix. Importantly, the absence of atypical or malignant cells confirms the benign nature of the lesion. These histopathological findings are crucial for accurate diagnosis and differentiation from other oral lesions.

Treatment :

Due to the benign nature of this condition, the management approach typically involves conservative measures. These include local surgical excision, laser ablation, or cryotherapy, all aimed at achieving complete removal of the lesion while preserving normal surrounding tissues. In cases of extensive involvement or recurrence, systemic corticosteroids or immunomodulatory agents may be considered to mitigate inflammatory response and prevent further progression.(19)

Prognosis :

Long-term prognosis for patients with plasma cell granuloma is generally favorable, with a low incidence of recurrence reported in most cases. Regular follow-up visits are recommended to monitor for any reappearance of lesions and ensure early intervention if necessary. Additionally, patient education plays a crucial role in preventing and managing potential complications, such as trauma or infection at the lesion site.(20)

Conclusion :

In conclusion, plasma cell granuloma in the oral cavity presents a challenge for healthcare professionals in diagnosis and management. Although its precise cause remains uncertain, a thorough understanding of its clinical presentation, diagnostic methods, and treatment options is crucial for effective intervention. Collaborative efforts among dentists, oral and maxillofacial surgeons, pathologists, and hematologists are key to providing optimal care for individuals affected by this perplexing condition. By staying informed about the latest research and advancements, healthcare providers can continually improve patient outcomes and enhance the quality of life for those living with plasma cell granuloma.

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1. ***Extraorally*** :

Fig 1 A : extraorally shows a diffuse swelling on the upper and lower lip region with mild hypopigmentation and angular cheilitis .

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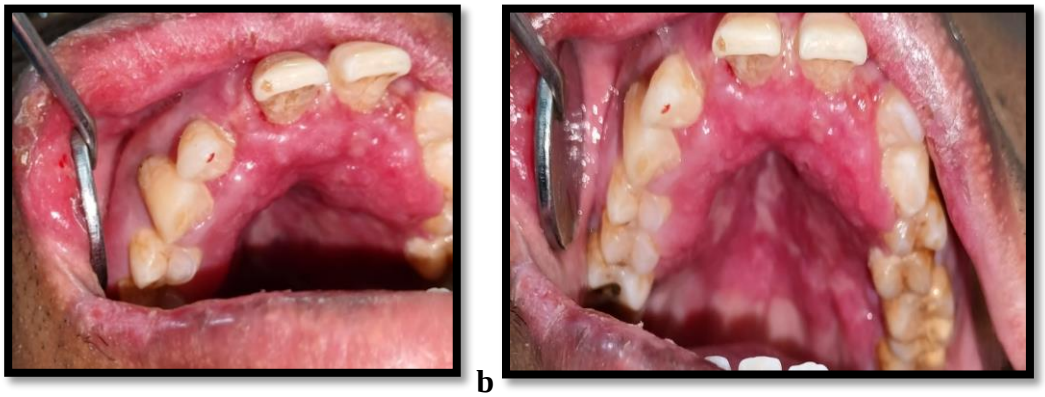
2. Intraorally :



A **b**

Fig 2 a & Fig 2 b shows generalised erythematous inflammation extending upto the palate crossing the midline .

3 : Gross specimen :

FIG 3 : Shows gross specimen 0.8 x0.6 cm , creamish white , soft to firm in consistency , incisional biopsy from right lower buccal mucosa

4. Microscopically :

Fig 4 a shows 4x view The given tissue is very scanty and devoid of epithelium.

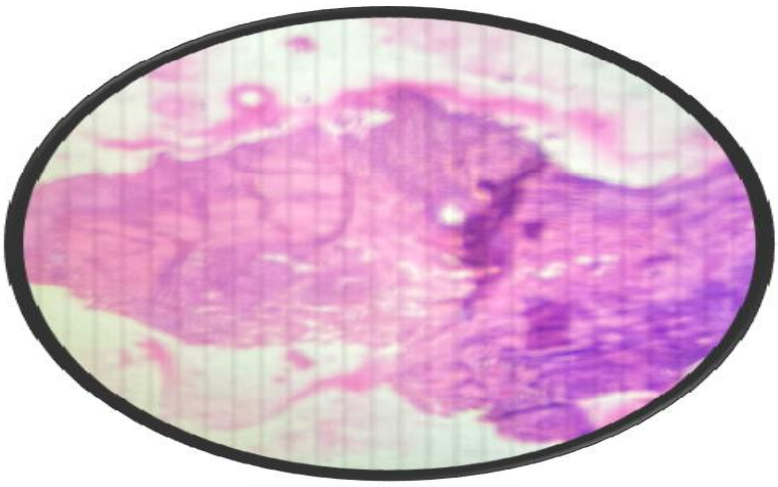


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fig 4b shows 10x view sheets of connective tissue consisting of widespread proliferation of round cells (plasma cells) with hyperchromatic nuclei, epitheloid cells and interspersed vascularity

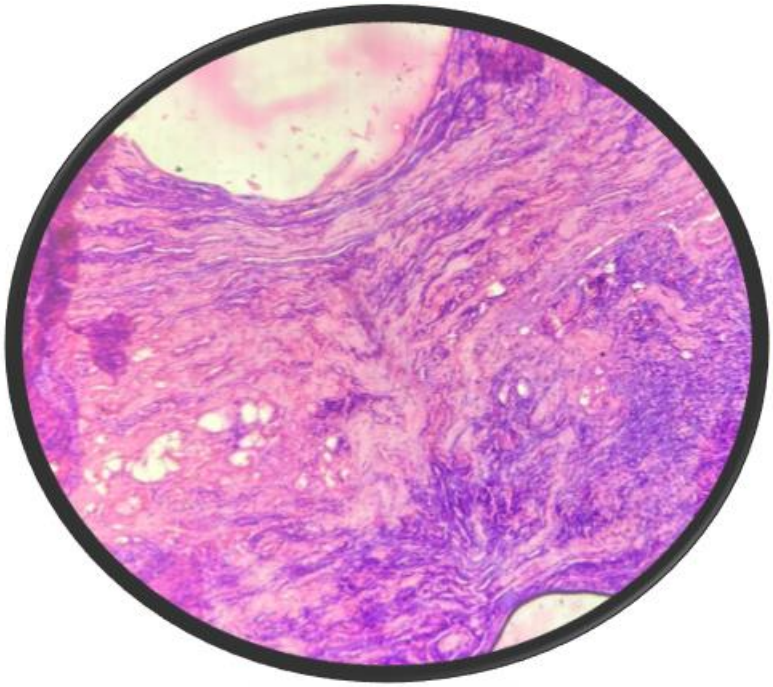
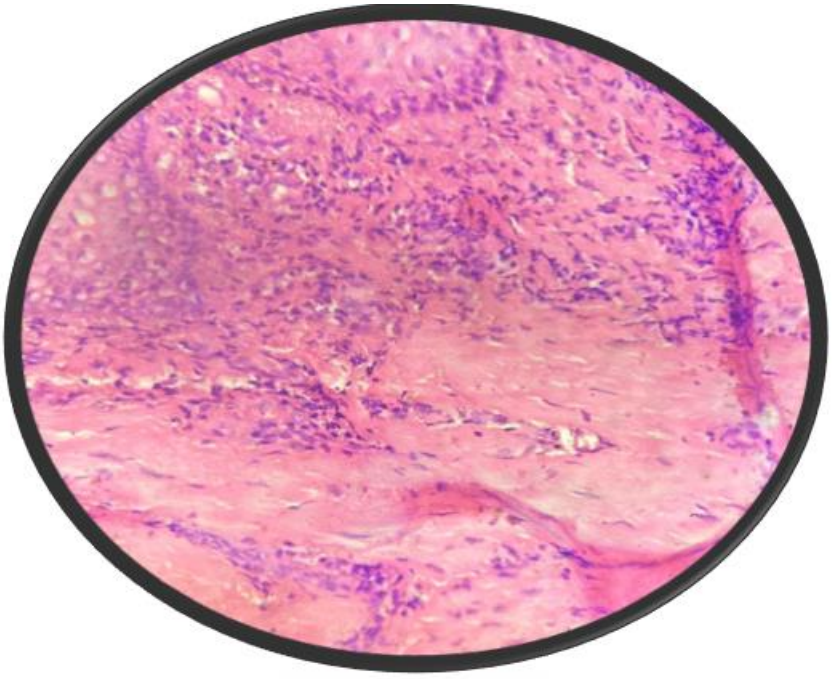


fig 4c : shows 40x view interspersed vascularity. However another part shows neural tissues and chronic inflammatory cells



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