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Case Report

"Oral Plasma Cell Granuloma - A Pseudo-Tumor?"

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Abstract

Plasma Cell Granuloma (PCG) is a rare reactive tumor like growth which is chiefly composed of plasma cell infiltration. The diagnosis of plasma cell lesions is challenging as these can be misinterpreted as various pathologies of soft tissue sometimes, thus the complete evaluation of patient and proper histopathological as well as IHC (Immunohistochemical) analysis of tissue is obligatory to rule out other lesions with poor prognosis. In this paper, we present two cases of PCG at different sites, one on gingiva and other on buccal mucosa mimicking as pyogenic granuloma clinically and plasma cell neoplasm histopathologically. The purpose of this paper is to make out proper diagnosis of such lesions not only on the basis of clinicopathological findings but also to perform immunohistochemical analysis to rule out other neoplasm which can be aggressive and also to advocate most suitable treatment plan for such entities.

Keywords: *Plasma Cell Granuloma (PCG); Plasma Cell Lesions; Oral Mucosa; IHC Markers (Kappa and Lambda)*

Introduction

Plasma cell granuloma (PCG) is a rare non-neoplastic lesion that was first described in 1973 by Bahadori and Liebow [1]. It has been classified as an inflammatory pseudotumour which may arise in any organ or soft tissues, including the lung, vagina, bladder and larynx [2].

Although its incidence in oral cavity is very rare but gingiva is the most frequently affected site. These lesions have no sex predilection and may occur at any age. Plasma cell granuloma has been called by different names like, inflammatory myofibroblastic tumor, Inflammatory pseudotumor, Inflammatory myofibrohistiocytic proliferation, and Xanthomatous pseudotumor [2,3].

Although exact etiopathogenesis of this lesion is unclear but pre-existing periodontal problems like periodontitis, peri-radicular inflammation, foreign body reaction, injury may act as most common predisposing factors. Consequently the use of drugs may also be considered as an etiological factor [4,5].

As PCG is a benign inflammatory lesion it requires biopsy and histopathological/immunohistochemical study to rule out possible neoplastic and plasma cell dyscrasias, and also to establish a differential diagnosis with other similar diseases such as multiple myeloma [6].

Case Report

A 22- year-old female patient referred to the department of oral and maxillofacial pathology, Saraswati Dental College with a chief complaint of painless growth on left buccal mucosa since 6 months. History of present illness revealed that the growth was slow growing, exophytic type with insidious onset. Patient had no history of trauma and no associated habit was recorded.

Intraoral clinical examination revealed tumor like growth on left buccal mucosa i.r.t 37. The growth was well circumscribed, oval in shape, greyish red in colour measuring about 2 x 1.5 cm in diameter. On palpation the growth was rough with well-defined margins and of soft to firm consistency. It was nontender, non-pulsatile, non-fluctuant and non-compressible in nature. A provisional diagnosis of pyogenic granuloma was made. An excisional biopsy was performed under local anaesthesia and the specimen was sent for histopathological examination.

Histopathological examination revealed parakeratinized stratified squamous epithelium and underlying dense connective tissue stroma. The connective tissue stroma was highly inflamed consisting of chronic inflammatory infiltrate predominantly composed of numerous plasma cells and few lymphocytes with proliferating endothelium lined blood vessels (Figure 1).

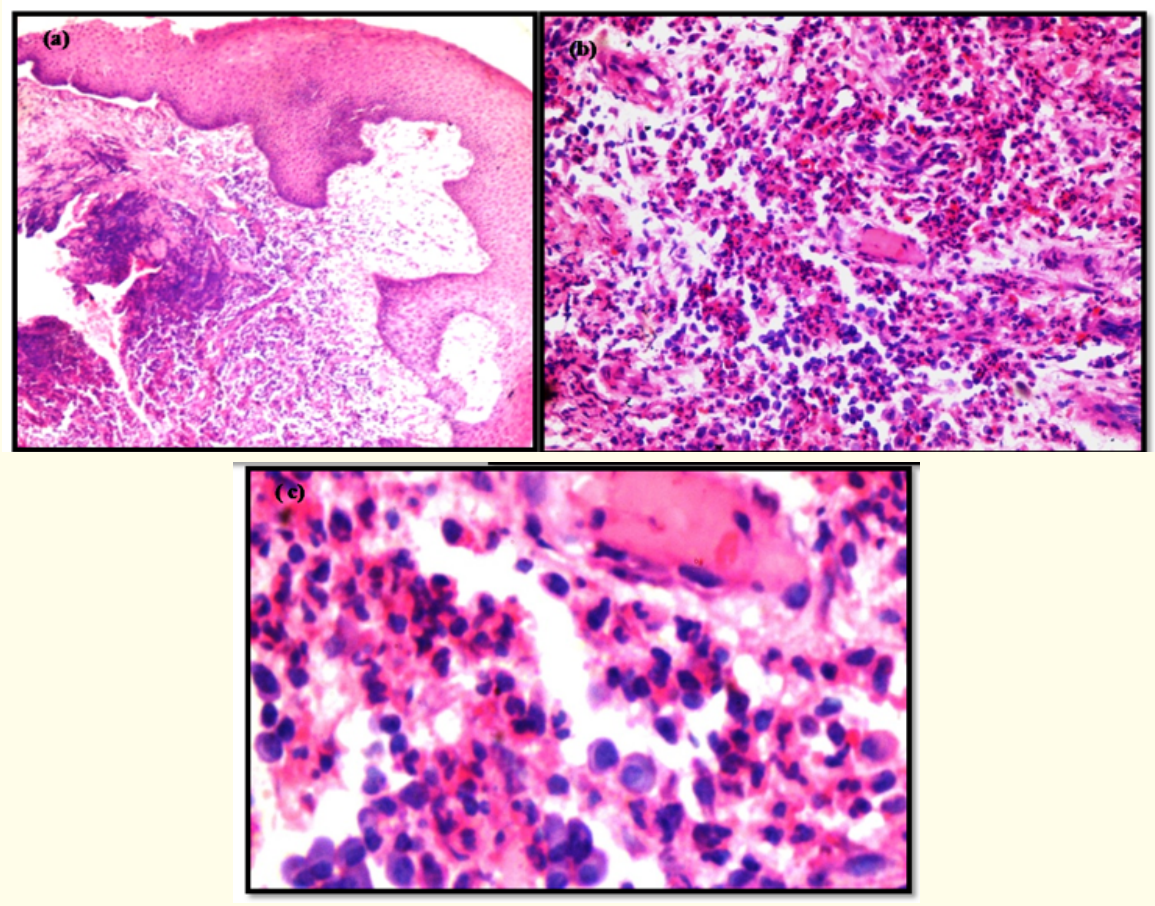

Figure 1: *(a) H&E stain at low magnification showing plasma cells infiltrate and elongated rete ridges, (b) H&E stain showing abundant plasma cells in connective tissue (x40), (c) H&E stain in high power showing plasma cells with eccentrically placed nucleus (x100).*

On the basis of clinicopathological findings the working diagnosis of plasma cell lesion was made. Immunohistochemical analysis for "Kappa and Lambda light chain" was carried out for confirmatory diagnosis to check the presence of plasma cells. A strong positivity for the kappa light chain was seen in the polyclonal plasma cell population (Figure 2) whereas, a weak expression was noted for the lambda light chain (Figure 3). Thus, on the basis of clinical, histopathological, and immunohistochemical analysis, the diagnosis of PCG was confirmed.

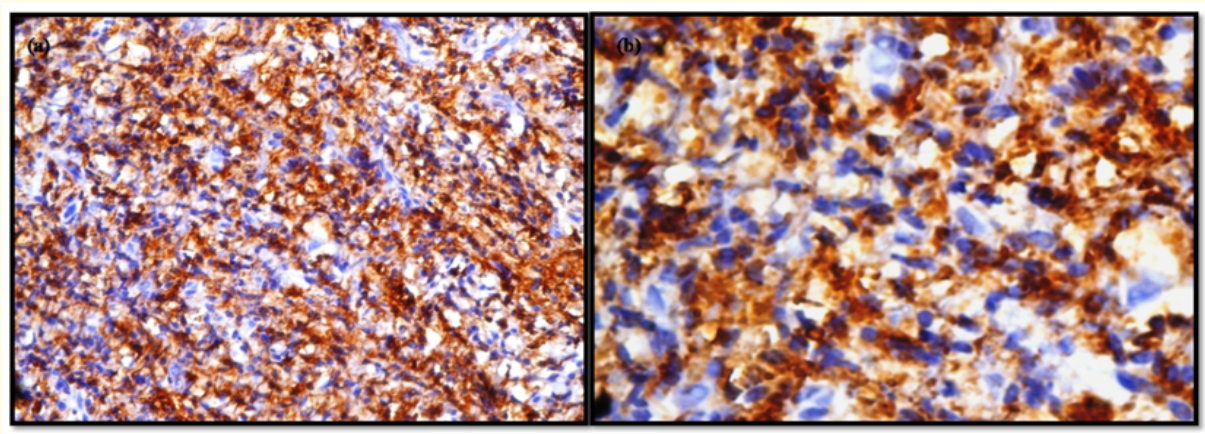

Figure 2: *(a) Immunohistochemistry for kappa light chain showing immunoreactivity presents in the cytoplasm of plasma cells (x100), (b) High power photomicrograph showing strong expression of kappa light chain.*

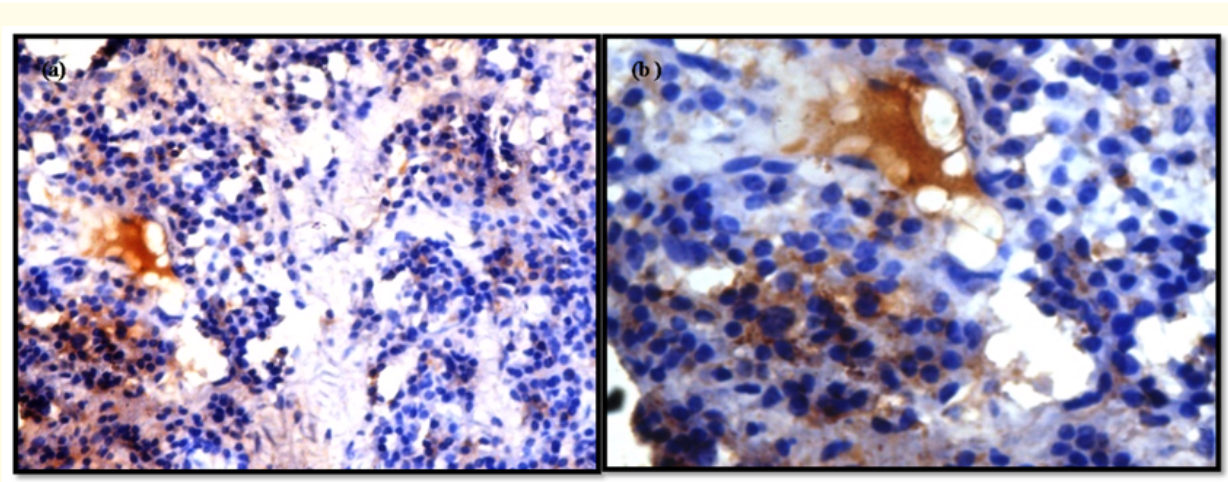

Figure 3: *(a) Immunohistochemistry for lambda light chain showing immunoreactivity presents in the cytoplasm of plasma cells (x100), (b) High power photomicrograph showing weak expression of lambda light chain.*

Discussion

Plasma cells are terminally differentiated B lymphocytes that provide protective immunity through the continuous secretion of antibodies. Plasma cells are not normally found in the circulation, but rather remain residents in their organ of choice for life; any antibody-secreting cells in the blood en route to, for example the bone marrow, are plasmablasts [7,8].

Plasma cell lesions of head and neck possess great diagnostic and therapeutic challenge. Plasma cell lesions of head and neck mainly categorized into four types: Multiple myeloma, Solitary myeloma (Solitary plasmacytoma of bone), Soft-tissue myeloma (Extramedullary plasmacytoma) and Plasma-cell granuloma. The first two multiple myeloma and solitary myeloma are tumors of bone while the soft tissue myeloma and PCG are tumors of the soft tissues origin. It is very important to differentiate last two soft-tissue lesions, as the soft-tissue myeloma (plasmacytoma) may represent early stages of multiple myeloma also [9].

Plasma cell granuloma (PCG) is a rare, uncommon, non-neoplastic and reactive tumor like- lesion whose aetiology, biological behaviour and most appropriate treatment is still uncertain. It is also found that at times PCG shows locally aggressive behaviour which may occasionally progress to form a true malignant neoplasm. While some cases were found to be associated with minor trauma or surgery leads to PCG. It comprises of abundance of inflammatory cells, with a predominance of plasma cells, in a fibrovascular background [2,10].

Although PCG is the least controversial of all plasma cell tumors and shows marked predilection for the oral cavity. In the oral cavity, it is a lesion primarily of the periodontal tissues origin [2].

It was first reported on gingival tissue as an asymptomatic, well circumscribed, reactive lesion. The gingiva is the area most frequently involved, with equal predilection for maxillary and mandibular gingivae. The tumors can also be seen anywhere in oral cavity like marginal, interdental and attached gingiva. Few literature has reported with the involvement of buccal mucosa. In the present paper it adopted both the involvement of gingiva and buccal mucosa as well [11-14].

The exact etiopathogenesis of this lesion is unknown but literatures have reported involvement of various factors in the development of PCG. Some cases were found to be associated with minor trauma or surgery. Consequently the use of immunosuppressive drugs like cyclosporin A may be considered as a one of the etiological factor [5].

In literature the possible role of virus have also been reported in the etiopathogenesis of PCG. The viruses like Epstein Barr Virus, *Actinomycetes* and *Nocardia* were reported in splenic, nodal, pulmonary and hepatic PCG respectively. *Mycoplasma* was also found to be associated with pulmonary type of PCG. Other organisms found in association of PCG include *Mycobacterium avium, Corynebacterium equi, Escherichia coli, Bacillus sphaericus, Pseudomonas, Helicobacter pylori* and *Coxiella burnetii* [15,16].

Demographically lesions are generally single having equal sex predilection with or without involvement of bone loss and can occur at any age group [1].

Clinically, PCG typically presents with two morphological types. Exophytic firm nodular mass type presents with a smooth surface which is well circumscribed and do not produce any significant systemic symptoms. Second type is ulcerative type. Intrabony presentation of PCG is rare [2,17].

The recent WHO Classification of soft tissue tumors includes three basic histopathological variants of plasma cell granulomas [18]:

1. Myofibroblast pattern loosely arranged in a myxoid edematous background, showing plasma cells, lymphocytes, eosinophils and blood vessels.
2. Spindle cells pattern- presence of dense aggregates of spindle cells arranged in a variable myxoid stroma and collagenized background, mixing a distinctive inflammatory infiltrate, diffuse groups of plasma cells and lymph nodes.
3. Predominance of collagen fibers- This variant may have cytologic atypia with nuclear pleomorphism and increased mitotic activity; these characteristics are rare and may be associated with malignant transformation.

Recurrences are dependent on the underlying cause of the reactive lesions [19].

Histopathologically, Plasma cell granuloma is characterized by a vascular and reactive stroma. Numerous reactive inflammatory cells, predominantly plasma cells and usually surrounded by connective tissue septa. No cytological abnormalities are detected. Sometimes evidence of intra-cytoplasmic eosinophilic hyaline droplets, known as Russell bodies may also be seen [11,20,21].

PCG is distinguished chiefly on the basis of histological findings and clonality of the plasma cells. Immunohistochemical analysis determines the clonality of the lesion. The kappa: Lambda light chain ratio is 2:1, whereas, in a neoplastic lesion the ratio is greater than 10:1 or 1:10. Monoclonal lesions include plasmacytoma and multiple myeloma while plasma cell granuloma shows polyclonality thus exhibiting both kappa and lambda light chains positivity [12,13].

A detailed histopathological examination is important to differentiate various plasma cell lesions such as PCG, plasma cell gingivitis, and extramedullary plasmacytoma act as possible precursors of multiple myeloma. It is also important to differentiate plasma cell granuloma from multiple myeloma and plasmacytoma. Multiple myeloma is a malignant tumor of bone with multiple systemic manifestations whereas plasmacytoma and plasma cell granuloma are soft tissue tumors. Plasmacytoma is believed to be precursor of multiple myeloma and PCG is mostly benign in nature, thus differentiating the two is essential for treatment plan [4,22].

The biological behavior of PCG is variable. In some cases it acts as a reactive inflammatory process, while in others as a benign tumour. Literature are showing malignant neoplastic behavior of PCG locally in association of infiltration and destruction of the affected tissues. The treatment of PCG depends on the aggressiveness of the lesion. Cases showing malignant behavior are treated by surgical excision, chemotherapy and/or radiotherapy; lesions behaving like benign neoplasias require only surgery. Reactive proliferations respond to medical management with corticosteroids and other immunosuppressants such as azathioprine [11-13].

With respect to prognosis, PCG seems to be a generally benign, nonrecurring condition; nevertheless, local aggressiveness, and recurrences may complicate the outcome of the disease [1,23,24].

Conclusion

Plasma cell granuloma is a rare benign lesion but its exact etiology, behavior and prognosis is still controversial. Attributing to the fact that it can resemble various pathological entity, it is difficult to establish the exact diagnosis alone on the basis of clinical or histopathological examination. Therefore, it is necessary to perform immunohistochemical analysis to diagnose it from other lesions that have a poor prognosis and have malignant transformation to avoid unnecessarily extensive and potentially destructive surgery as the treatment plan.

Conflict of Interest

Authors has no conflict of interest.

Bibliography

1. Bahadori Moslem and Averill A Liebow. "Plasma Cell Granulomas of the Lung". *Cancer* 31.1 (1973): 191-208.

2. Jhingta Pravesh Kumar., *et al*. "An enigmatic clinical presentation of plasma cell granuloma of oral cavity". *Contemporary Clinical Dentistry* 9.1 (2018): 132-136.

3. Manohar Balaji and S Bhuvaneshwari. "Plasma Cell Granuloma of Gingiva". *Journal of Indian Society of Periodontology* 15.1 (2011): 64-66.

4. Bansal Neha., *et al*. "Plasma Cell Granuloma of Gingiva-A Rare Case Report". *International Journal of Scientific Study* 1.3 (2013): 155-158.

5. Yao Xin., *et al*. "Plasma Cell Granuloma: A Case Report of Multiple Lesions in the Lung and Review of the Literature". *The American Journal of the Medical Sciences* 334.5 (2007): 402-406.

6. Ide Fumio., *et al*. "Plasma Cell Granuloma of the Oral Mucosa with Angiokeratomatous Features: A Possible Analogue of Cutaneous Angioplasmocellular Hyperplasia". *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology* 89.2 (2000): 204-207.

7. "Plasma Cells". Encyclopedia of Life Sciences.

8. Shapiro-Shelef Miriam and Kathryn Calame. "Regulation of Plasma-Cell Development". *Nature Reviews Immunology* 5.3 (2005): 230-242.

9. Acevedo Alejandro and John E. Buhler. "Plasma-Cell Granuloma of the Gingiva". *Oral Surgery, Oral Medicine, Oral Pathology* 43.2 (1977): 196-200.

10. Stark Pinhas., *et al*. "Inflammatory Pseudotumor of the Heart with Vasculitis and Venous Thrombosis". *Chest* 102.6 (1992): 1884-1885.

11. Reyes Edgar., *et al*. "Plasma Cell Granuloma in Oral Cavity: A Case Report". *Journal Oral of Research* 4.5 (2015): 335-349.

12. Pandav Amit kumar B., *et al*. "Gingival plasma cell granuloma". *Dental Research Journal* 9.6 (2012): 816-820.

13. Pandav Gaurav., *et al*. "Gingival plasma cell granuloma: An enigmatic infl amatory pseudo-tumour with literature review". *International Journal of Contemporary Dental and Medical Review* (1992): 240115.

14. Batsakis John G. "Plasma Cell Tumors of the Head and Neck". *Annals of Otology, Rhinology and Laryngology* 92.3 (1983): 311-313.

15. Dehner Louis P. "The Enigmatic Inflammatory Pseudotumours: the Current State of Our Understanding, or Misunderstanding". *The Journal of Pathology* 192.3 (2000): 277-279.

16. Narla Lakshmana Das., *et al*. "Inflammatory Pseudotumor". *RadioGraphics* 23.3 (2003): 719-729.

17. Seoane Juan., *et al*. "The spectrum of plasma cell neoplasia in oral pathology". *Oral Medicine* 8.4 (2003): 269-208.

18. Thompson Lester DR. "Update From the 4th Edition of the World Health Organization Classification of Head and Neck Tumours: Tumours of the Ear". *Head and Neck Pathology* 11.1 (2017): 78-87.

19. Renfrow Jaclyn J., *et al*. "Relapsing intracranial plasma cell granuloma: A case report". *Oncology Letters* 7.2 (2013): 531-533.

20. Merza Hussein and Raj Sarkar. "Solitary Extraosseous Plasmacytoma". *Clinical Case Reports* 4.9 (2016): 851-854.

21. Jawanda Manveenkaur., *et al*. "Oral Plasma Cell Granuloma: A Case Report of an Ambiguous Lesion". *Journal of the International Clinical Dental Research Organization* 6.1 (2014): 55-58.

22. Sato Yasuharu and Tadashi Yoshino. "IgG4-Related Lymphadenopathy". *International Journal of Rheumatology* (2012): 572539.

23. Arana Small Octavio and Saavedra Small Monica. "Granuloma de Células Plasmáticas Labial. Presentación de un caso". *Dermatolgia Peruana* 18.1 (2008): 51-54.

24. Gleason BC and JL Hornick. "Inflammatory Myofibroblastic Tumours: Where Are We Now?" *Journal of Clinical Pathology* 61.4 (2008): 428-437.

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