International Journal of Research and Reports in Dentistry

Volume 7, Issue 1, Page 39-43, 2024; Article no.IJRRD.116689

A Case Report on Peripheral Giant Cell Granuloma of Gingiva

Ankita Sharma [a*], Shailendra S. Chauhan [a] and Radha Kumari [a]

[a] K.D Dental College and Hospital Mathura, Uttar Pradesh, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/116689

Case Study

Received: 27/02/2024
Accepted: 29/04/2024
Published: 02/05/2024

ABSTRACT

The most prevalent giant cell lesion in the mouth is called a peripheral giant cell granuloma, also referred to as "giant cell epulis." Typically, it manifests as a soft tissue purplish-red nodule with extravasated red blood cells and mononuclear stromal cells surrounding the multinucleated large cells. It is unlikely that this lesion is a real tumor; instead, it may be reactive in character, thought to be triggered by trauma or local irritation, however the exact etiology is unknown. This article describes a 60-year-old female patient who had a peripheral giant cell granuloma that originated in the maxillary anterior area. The lesion was entirely removed down to the periosteum, and the biopsy site shows no signs of ongoing or lingering swelling or bone defects after a follow-up period of 12 months.

Keywords: Giant cell granuloma; peripheral; maxillary anterior; osteoclastic activity.

**Corresponding author: Email: ankitasharma041296@gmail.com;*

1. INTRODUCTION

PGCG, or peripheral giant cell granuloma, is the most prevalent giant cell lesion in the mouth. It manifests as a soft tissue extra-osseous purplish-red nodule that consists of multinucleated giant cells surrounded by extravasated red blood cells and mononuclear stromal cells. It's likely that this lesion is reactive in nature rather than a real tumor. Although the exact cause is unknown, it has been suggested that the starting stimulus was brought on by trauma or local discomfort. The granuloma in question has been referred to as a "reparative" granuloma of peripheral giant cells; nevertheless, its true reparative character remains uncertain due to its osteoclastic activity nature.

“Its osteoclastic activity when cultured in vitro and its membrane receptors for calcitonin, as shown by immunohistochemistry, are indications that the lesions are osteolytic” [1–5]. “However, other writers have proposed that the lesion is generated by cells of the mononuclear phagocyte system”. [6] “At the microscope level, the PGCG closely resembles the central giant cell granuloma. In fact, some Authors think that the PGCG is a soft tissue lesion” [7].

2. CASE REPORT

A 60-year-old female patient presented to the department of periodontology and oral implantology, complained of swelling in her right upper jaw form last one year. History showed that the swelling began as a tiny in size and grew over the course of a year to its current magnitude. It was linked to sporadic discomfort. Trauma, neurological impairment, fever, loss of appetite or weight loss was not present in the past. No other portion of the body exhibited any comparable edema. Systemically, the patient was in good health.

During an extraoral examination, the right side of the face, namely the anterior maxilla region, showed a solitary, diffuse edema. The enlargement was roughly 2 by 2 cm in size. The swelling was present in relation to 21, 22, and 11 and had a lobulated surface. The bluish-colored bulge had a hard firmness, and the mucous membrane covering it was unbroken [Fi. 1]. No bone resorption was visible on the orthopantomogram or intraoral periapical radiographs. [Fig. 2] Numerous serological tests, which were within normal ranges, were recommended, including serum calcium level, parathormone, and alkaline phosphatase levels. A tentative diagnosis of persistent pyogenic granuloma was made in light of the clinical findings.

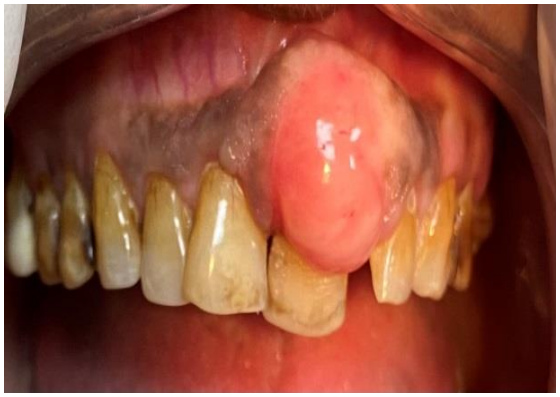

Fig. 1. Swelling measured about 2 × 2 cm

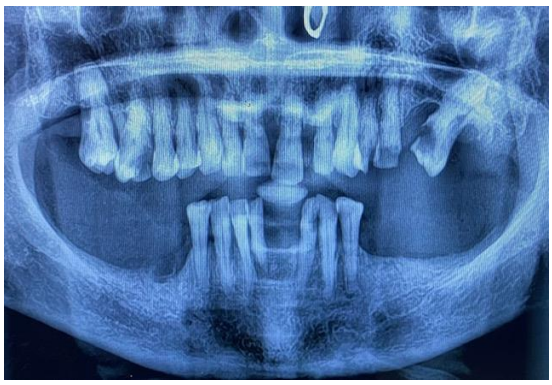

Fig. 2. OPG showing no bone Resorption irt 11, 12and13

Peripheral giant cell granuloma, inflammatory fibrous hyperplasia, peripheral ossifying fibroma, hormonal tumor, and capillary hemangioma were among the differential diagnoses that were taken into consideration. Under local anesthetic, the surgery (excisional biopsy) was scheduled (LA). The mucosa on top was cut and weakened. Lesion was excised in a single piece after being bluntly dissected with a diode laser to separate it from the surrounding tissue [Fig. 3-4]. The specimen was transported to be examined histopathologically. After a year of follow-up, there was no sign of a recurrence [Fig. 5].

3. HISTOPATHOLOGY

The biopsied specimen, upon histopathologic analysis, was found to be oval in shape, firm in consistency, and approximately 2 × 2 cm in dimension [Fig. 5]. The connective tissue stroma

was densely packed with plump fibroblasts that were constantly multiplying. There were several large cells with 8–15 nuclei, varying in size and form, and proliferating, dilated endothelial-lined blood capillaries with extravasated red blood cells (RBCs). There were also a few large cells visible inside the vascular spaces. The stroma also showed many ossifications [Fig. 6].

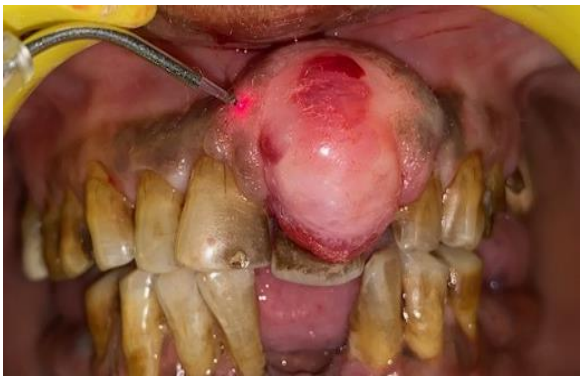

Fig. 3. Blunt dissection with diode laser

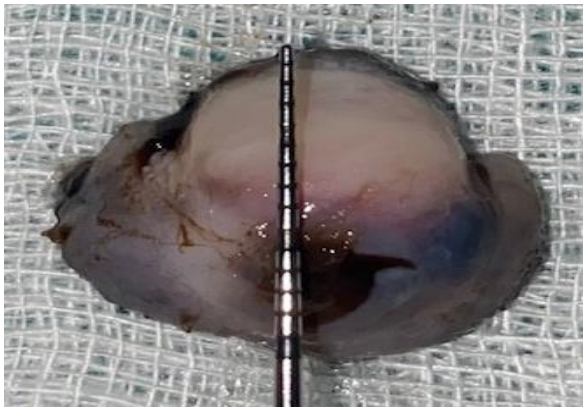

Fig. 4. Excised tissue

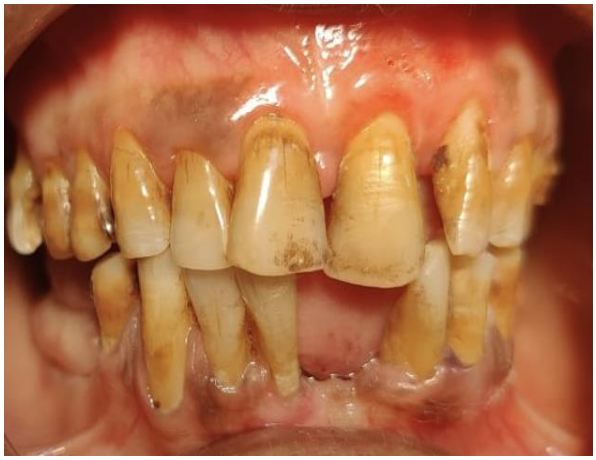

Fig. 5. follow up after 12 months

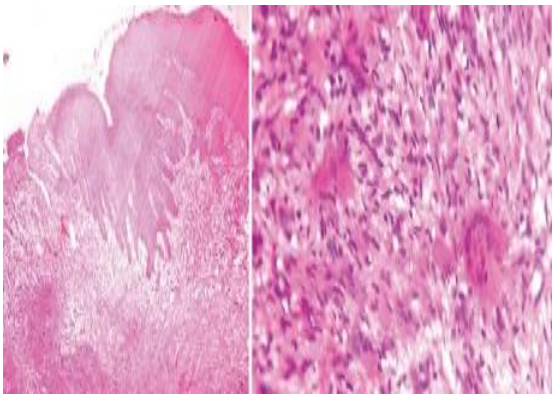

Fig. 6. Nodular proliferations of multinucleated giant cells

4. DISCUSSION

The cause and nature of giant cell epulides, or PGCG, are yet unknown. The existence of multinucleated giant cells has been explained by a number of theories in the past, such as the idea that they are osteoclasts left over from the natural resorption of teeth or a response to periosteum damage. Given that these cells have been demonstrated to have calcitonin receptors and the ability to excavate bone in vitro, there is compelling evidence that they are osteoclasts.

The PGCG is a lifelong condition that peaks in incidence in the ages of 30 to 40 and during the mixed dentition years [8,7,9] Females are more likely to have it (60%).[7,9] The maxilla is impacted less frequently than the mandible.[7,9] Large lesions are possible; some have grown to be 2 cm in diameter. “Although the PGCG frequently has a more bluish-purple color than the bright red color of a typical pyogenic granuloma, the clinical presentation is comparable to that of the more common pyogenic granuloma. The PGCG linked to dental implants has also been identified recently’’ [10].

Occasionally, "cupping" superficial resorption of the underlying alveolar bony crest is observed, despite the fact that the PGCG originates within soft tissue. “It can occasionally be challenging to distinguish between a mass that is a central giant cell granuloma that is eroding through the cortical plate and into the gingival soft tissues and a peripheral lesion” [11-13].

The gingival extra-osseous lesions associated with cherubism bear a striking resemblance to

giant cell epulides. Nonetheless, the accurate diagnosis will be revealed by the additional unique clinical and radiological characteristics of cherubism.[14]

“Histologically, PGCG is made up of nodules of multinucleated large cells surrounded by extravasated RBCs and plump, ovoid, spindle-shaped mesenchymal cells”. [15] There could be as few as a few nuclei in the big cells or as many as several hundred. While some exhibit small, pyknotic nuclei, others have massive, vesicular nuclei. It is uncertain where the enormous cell originated. Studies on immunology and ultrastructure [2–6] have demonstrated that osteoclasts are the source of the large cells [16].

“A growing consensus also suggests that large cells might just be a reactive part of the lesion, produced from bone marrow mononuclear cells via the bloodstream and possibly only present in response to an unidentified signal from the stroma. This idea is based on findings from a few more recent research that included transplanting and cell culture” [17,18], where it was discovered that the stromal cells are actively proliferating whereas the large cells are short-lived and perish early in culture. The stromal cells secrete a range of cytokines and differentiation factors, such as osteoclast differentiation factor (ODF), monocyte chemoattractant protein-1 (MCP1), and macrophage-colony stimulating factor (M-CSF), according to a study by Willing et al. [19]. “The stromal cell may drive blood monocyte immigration into tumor tissue and improve their fusion into multinucleated giant cells that resemble osteoclasts. These chemicals are monocyte chemoattractant and are crucial for osteoclast differentiation. Moreover, it is thought that the recently discovered disintegrin and metalloprotease (ADAM) family of membrane-bound proteins contributes to the multinucleation of osteoclasts and large cells produced from mononuclear precursor cells” [20].

Receptor activator of nuclear factor (NF)-kappa ligand (RANKL), which has been shown to be crucial for osteoclast genesis, as well as its receptor, receptor activator of NF-kappa B (RANK), and its decoy receptor, osteoprotegerin (OPG), were all detected by in situ hybridization in the most recent study by Bo Liu et al. [5]. They came to the conclusion that the expression of RANK, OPG, and RANK in these lesions may be crucial for the development of multinucleated giant cells.

5. CONCLUSION

Plasma cell granuloma of the gingiva is a rare entity that may be confused with a malignant tumor on clinical and radiographic grounds. The gross and microscopic similarities to other oral spindle cell tumors can also be misinterpreted as those of a more aggressive lesion. So awareness of oral PCG/inflammatory pseudotumors and its distinctive morphologic features is important in avoiding the misdiagnosis. It is also important to recognize this entity as a benign inflammatory lesion to avoid unnecessarily extensive and potentially destructive surgery. We report here this case for its rarity.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Bonetti F, Pelosi G, Martignoni G, Mombello A, Zamboni G, Pea M. Peripheral giant cell granuloma: Evidence for osteoclastic differentiation. Oral Surg Oral Med Oral Pathol. 1990;70:471–5.
2. Lim L, Gibbins JR. Immunohistochemical and structural evidence of a modified microvasculature in the giant cell granuloma of the jaws. Oral Surg Oral Med Oral Pathol. 1995;79:190–8.
3. Mighell AJ, Robinson PA, Hume WJ. PCNA and Ki-67 immunoreactivity in multinucleated cells of giant cell fibroma and peripheral giant cell granuloma. J Oral Pathol Med. 1996;25:193–9.
4. Souza PE, Mesquita RA, Gomez RS. Evaluation of p53, PCNA, Ki-67, MDM2 and AgNOR in oral peripheral and central giant cell lesions. Oral Dis. 2000;6:35–9.

5. Bo Liu, Shi-Feng Yu, Tie-Jun Li. Multinucleated giant cells in various forms of giant cell containing lesions of the jaws express features of osteoclasts. J Oral Pathol Med. 2003;32:367.
6. Carvalho YR, Loyola AM, Gomez RS, Araujo VC. Peripheral giant cell granuloma. An immuno-histochemical and ultrastructural study. Oral Dis. 1995;1:20–5.
7. Katsikeris N, Kakarantza-Angelopoulou E, Angelopoulos AP. Peripheral giant cell granuloma. Clinicopathologic study of 224 new cases and review of 956 reported cases. Int J Oral Maxillofac Surg. 1988;17:94–9.
8. Giansanti JS, Waldron CA. Peripheral giant cell granuloma: review of 720 cases. J Oral Surg. 1969;27:787–91.
9. Hirshberg A, Kozlovsky A, Schwartz-Arad D, Mardinger O, Kaplan I. Peripheral giant cell granuloma associated with dental implants. J periodontol. 2003;74:1 381–4.
10. Dayan D, Buchner A, Spirer S. Bone formation in peripheral giant cell granuloma. J Periodontol. 1990;61:444–6.
11. Smith BR, Fowler CB, Svane TJ. Primary hyperparathyroidism presenting as a “peripheral” giant cell granuloma. J Oral Maxillofac Surg. 1988;46:65–9.
12. Burkes EJ, White RP. A peripheral giant-cell granuloma manifestation of primary hyperparathyroidism: report of case. J Am Dent Assoc. 1989;118:62–4.
13. Odell EW, Morgan PR. Biopsy pathology of the oral tissues. London: Chapman Hall Medical; 1998;111.
14. Flanagan AM, Tinkler SMB, Horton MA, Williams MD, Chambers DJ. The multinucleated giant cell granulomas of the jaws are osteoclasts. Cancer. 1988;62:1139–45.
15. Bischof M, Nedir R, Lombardi T. Peripheral giant cell granuloma associated with a dental implant. International Journal of Oral and Maxillofacial Implants. 2004;19(2):295-302.
16. El-Mofty SK, Osdoby P. Growth behaviour and lineage of isolated and cultured cells derived from giant cell granuloma of the mandible. J Oral Pathol. 1985;14:539–52.
17. Cohen MA, Grossman ES, Thompson SH. Features of central giant cell granuloma of the jaws xenografted in nude mice. Oral Surg Oral Med Oral Pathol. 1988;66:209.
18. Willing M, Engels C, Jesse N, Werner M, Delling G, Kaiser E. The nature of giant cell tumor of bone. J Cancer Res Clin Oncol. 2001;127:467–74.
19. Abe E, Mocharla H, Yamate T, Taguchi Y. Monolages SC.Meltrinalpha, a fusion protein involved in multinucleated giant cell and osteoclast formation. Calcif Tissue. 1999;64:508–15.
20. Padam Narayan Tandon, S K Gupta, Durga Shanker Gupta, Sunit Kumar Jurel, Abhishek Saraswat. Peripheral giant cell granuloma, 2012 Apr;3(Suppl 1):S118-21. DOI: 10.4103/0976-237X.95121.

Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/116689