Content available at: https://www.ipinnovative.com/open-access-journals

International Dental Journal of Student's Research

Journal homepage: https://www.idjsronline.com/

Case Report

Peripheral Giant Cell Granuloma in a partially edentulous patient: A case report with literature review

Laboni Ghorai[1]*, Maumita Bhattacharya[2], Ishita Banerjee[1], Subhalakshmi Sen[2], Rakhshith Shetty[2]

[1]Dept. of Oral Medicine and Maxillofacial Radiology, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata, India.
[2]Dept. of Oral and Maxillofacial Pathology, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata, India.

Abstract

Peripheral Giant cell Granuloma (PGCG) is a relatively infrequent benign exophytic reactive lesion of oral cavity, which arises from the periodontal ligament or the mucoperiosteum secondary to local irritation or chronic trauma. Clinically, it usually manifests as a non-tender, soft to firm, sessile or pedunculated soft tissue nodule with surface colour disparity and may be of variable sizes, but when the size of the lesion exceeds a certain limit, it can cause hindrance in occlusion and function. Radiographic features being nonspecific, histopathologic analysis remains the mainstay for definitive diagnosis of this entity. Treatment includes complete surgical excision from base of the lesion due to its rapidly penetrating nature and high risk of recurrence. This article reports a case of PGCG in mandibular posterior region, that hindered denture placement and impeded the masticatory function.

Keywords: Peripheral Giant cell Granuloma, Reactive lesion, Recurrence

Received: 19-02-2025; **Accepted:** 10-03-2025; **Available Online**: 27-03-2025

1. Introduction

Oral mucosa is vulnerable to various stimuli, both external and internal, that can induce reactive hyperplastic lesions. Reactive hyperplastic lesions are defined as excessive proliferation of connective tissue secondary to traumatic injury, hormonal change or certain medications but are most commonly associated with local low-grade irritants such as dental plaque and calculus, chronic biting habits, sharp edges of grossly carious teeth, overhanging dental restorations, ill-fitting dental/oral appliances and food impactions. In the oral cavity, the gingival reactive hyperplastic lesions include pyogenic granuloma, fibroepithelial hyperplasia, peripheral fibroma, peripheral ossifying fibroma and peripheral giant-cell granuloma, which are collectively described as "epulides," a Greek word meaning "on the gingiva." Clinically, they are often indistinguishable and occasionally might possess a stark resemblance with benign neoplastic proliferations, posing diagnostic challenges. However, these lesions can only be differentiated from each other histopathologically due to presence of one or more distinct connective tissue components like endothelial cells, collagen, bone and multinucleated giant cells.[1-3]

This paper reports of a case of peripheral giant cell granuloma arising at the left mandibular posterior residual alveolar ridge region in a 61-year-old Asian female using a faulty prosthesis.

2. Case Report

A 61-year-old female patient reported to the Department of Oral Medicine and Maxillofacial Radiology, Kusum Devi Sunderlal Dugar Jain Dental College and Hospital, Kolkata, West Bengal, India, with a chief complain of swelling on the left side of lower jaw since past 3 months. The patient reported of gradual increase in size of the lesion with sudden upsurge in last 15 days due to which she was unable to position her lower denture and was experiencing occasional

*Corresponding author: Laboni Ghorai
Email: dr.labonidey@gmail.com

DOI: https://10.18231/j.idjsr.2025.010

pain on application of pressure. The patient was hypertensive since past 25 years and was under anti-hypertensive medication (Amlodipine 5mg) with no history of recent change in medication. No history of external trauma was reported at that site. Extra-oral examination revealed no obvious facial asymmetry, no evidence of similar swelling in any other part of the body but the left submandibular lymph node was palpable and non-tender. Intra-oral examination revealed edentulous maxillary arch and partially edentulous mandibular arch, the missing teeth being replaced by complete and removable partial dentures respectively. The remaining mandibular teeth in relation to 33,43,44,45 were mobile and the patient had poor oral and denture hygiene. Furthermore, a solitary well-defined pedunculated exophytic soft tissue overgrowth, roughly oval in shape and measuring approximately 2.5X1.5 cm in greatest dimension was noted on the residual alveolar ridge in relation to 34,35 region. The surface of the lesion was lobulated, displayed colour disparity with mostly purplish-red tint interspersed with areas of keratosis.(**Figure 1**) On palpation, it was non-tender, soft-firm in consistency and bleeding on probing was elicited. Examination of the mandibular removable partial denture revealed exposure of metal clasp on the tissue surface of the part of denture that was in contact with the lesion. An intra-oral periapical radiograph in relation to 33,34,35 region (**Figure 2**) demonstrated superficial erosion of the alveolar bone in relation to 34,35 region and severe periodontitis with floating tooth appearance in relation to 33. Routine blood investigations were within normal range. Based on the patient history, clinico-radiographic and haematological findings, a provisional diagnosis of PGCG was considered with pyogenic granuloma and peripheral ossifying fibroma as differential diagnoses.

The lesion was surgically excised deep down to the periosteum under local anaesthesia and removed in one piece. The extraction of associated tooth in relation to 33 was also done and complete haemostasis was achieved following placement of sutures. The specimen preserved in 10% formalin was then sent for histopathological analysis. Gross examination of biopsy revealed greyish-white irregular mass, firm in consistency and measuring about 21×16×11 mm in dimension. Histopathological examination (**Figure 3**) revealed parakeratinized stratified squamous surface epithelium with areas of ulceration and underlying fibrillar stroma demonstrated proliferating fibroblasts, chronic inflammatory cell infiltrate, multiple small and large engorged blood vessels and numerous large multinucleated giant cells of varying shapes, confirming the diagnosis of PGCG. The patient presented with adequate mucosal healing of the surgical site 15 days post-operatively (**Figure 4**) and reported no sign of recurrence till date.

Figure 1: Clinical view of the lesion

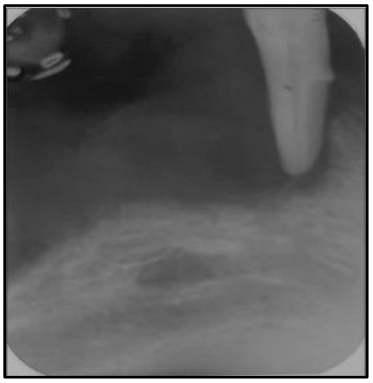

Figure 2: Intraoral periapical Radiograph showing superficial bone erosion irt 34,35 regions

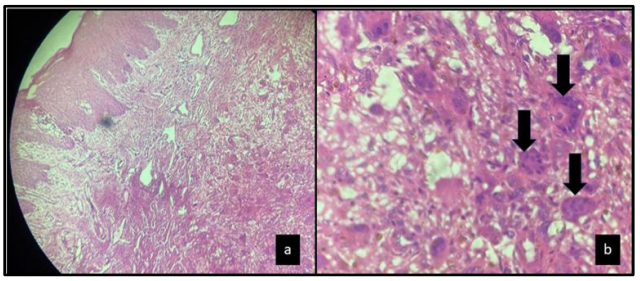

Figure 3: Histopathological view of the lesion **a:** Stratified squamous epithelium (parakeratinized) with irregular rete ridges, as seen after H&E staining and at 10X magnification, **b:** Connetive tissue stroma with multinucleated giant cells, as seen after H&E staining and at 40X magnification]

Figure 4: Clinical view of post-operative healing.

3. Discussion

PGCG, often addressed by variable nomenclature such as peripheral giant cell tumour, reparative giant cell granuloma, giant cell epulis, osteoclastoma and giant cell hyperplasia of the oral mucosa, is a relatively uncommon reactive hyperplasia of connective tissue that results from trauma to gingival tissues or alveolar mucosa.[4] Most typical feature of this lesion is the presence of multinucleated giant cells which are proposed to be the osteoclasts left from physiological tooth resorption or reaction to periosteal injury. These osteoclasts have receptors for calcitonin and are able to destruct bone. Various theories exist in favour of multinucleation of these osteoclasts. Abe et al (1999) identified membrane-bound protein family- a disintegrin and metalloprotease (ADAM) which is thought to play a role in the multinucleation process. Wulling et al (2001) proposed cytokine-mediated stimulation of blood monocyte immigration into tumour tissue and their fusion into osteoclast like multinucleated giant cells. Liu et al (2003) through their study established that multinucleation is influenced by receptor activator of NF-kappaB ligand (RANKL) which is essential in osteoclastogenesis and its decoy receptor osteopritegrin (OPG) expressed in these lesions.[5] Some authors also suggested that they arise secondary to an alteration of the endothelial cells of the capillaries (Flaitz CM 2000) whereas, Palacios et al suggested that giant cell formation to be a fusion of hystiocytes, endothelial cells and fibroblasts.[6]

3.1. Clinico-radiographic features

Of all the reactive hyperplasias found intraorally, incidence of PGCG is reported to vary from 5.1-43.6%. Although the lesion may be found in very young children as well as in dentulous or edentulous elderly person, most patients are in fourth to sixth decade of life, female predilection (60%) has been reported with mandible being more commonly affected. The lesion usually grows up to 2cm in size, although large lesions in excess of 5cm have also been reported in the literature. PGCG occurs exclusively on the gingiva or edentulous alveolar ridge, presenting as a reddish-blue sessile or pedunculated nodular mass. Secondary ulceration due to trauma may give the lesions a focal yellow zone due to formation of a fibrin clot over the ulcer. Although not an intraosseous disease but peripheral giant cell granuloma may affect the underlined jaws through "cupping" resorption of the underlying alveolar bone. Occasionally, it may become challenging to distinguish a soft tissue mass which arose as a peripheral lesion from a central giant cell granuloma that eroded through the cortical plate into the gingival soft tissues.[7-8]

3.2. Histological features

The clinic-radiographic features being non-pathognomic of PGCG, histopathological analysis becomes the mainstay of its differentiation from other reactive hyperplasias. Microscopic examination of PGCG shows a characteristic presence of multinucleated giant cells within the connective tissue stroma. The giant cells may have nuclei in varying numbers ranging from few to several dozens and nuclei may have varied shapes and sizes ranging from large and vesicular to small and pyknotic. Abundant haemorrhage resulting in deposition of hemosiderin pigment is frequently found at the periphery of lesion. PGCG is often regarded as the soft tissue counterpart of the central bony lesion as it bears stark microscopic resemblance with central giant cell granuloma.[7] However, immunohistochemical analysis may help in their differentiation as the expression levels of CD163 are found to be higher in PGCGs while CGCGs expressed CD68 at greater levels than PGCGs.[9] It has also been reported that CGCG shows higher expression of matrix metalloproteinase-9 (MMP-9) which modulates bone resorption in pathological conditions.[10]

3.3. Treatment and recurrence

The treatment of PGCG consists of local surgical excision deep down to the level of underlying bone. In addition to conventional scalpel approach, surgical excision using advanced modality like high power diode laser has also been explored with promising outcome owing to minimal intra-operative haemorrhage, reduced post-surgical pain and rapid post-operative wound healing. The adjacent teeth with poor prognosis should be extracted and the sound ones should be carefully cleaned through scaling and root planning to minimize the risk of recurrence. Approximately 10% of lesions are reported to recur and re-excision must be performed.[7-11]

4. Conclusion

Epulides are localized gingival enlargements which are often treacherous and might hide various pathological entities. A thorough clinical, radiological, histological and immunohistochemical examinations might help clinicians to formulate an accurate diagnosis which is essential for the management of these gingival overgrowths, minimizing the possibility of recurrence.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Kashyap B, Reddy PS, Nalini P. Reactive lesions of oral cavity: A survey of 100 cases in Eluru, West Godavari district. *Contemp Clin Dent*. 2012;3(3):294–7.
2. Reddy V, Saxena S, Saxena S, Reddy M. Reactive hyperplastic lesions of the oral cavity: A ten-year observational study on North Indian Population. *J Clin Exp Dent.* 2012;4(3):136-40.
3. Ramu S, Rodrigues C. Reactive hyperplastic lesion of oral cavity. A retrospective study of 260 cases. *World J Dent.* 2012;3(2):126-30.
4. Shafer WG, Hine MK, Levy BM. A Textbook of Oral Pathology. 6th ed. Philadelphia, PA: WB Saunders Co.; 1983. p-917

5. Moghe S, Gupta MK, Pillai A, Maheswari A. Peripheral Giant cell granuloma: a case report and review of literature. *People's J Sci Res.* 2013;6:55-9.
6. Falaschini S, Ciavarella D, Mazzanti R, Di Cosola M, Turco M, Escudero N, Bascones A, Lo Muzio L. Peripheral giant cell granuloma: immunohistochemical analysis of different markers. Study of three cases. Av. *Odontoestomatol.* 2007;23(4):189-96.
7. Neville BW, Damm DD, Allen CM, Bouquot JE. Oral and maxillofacial pathology. 3rd Edition, Saunders Elsevier, 2009. p-984
8. Agrawal A, Murari A, Singh A, Vutukuri S. Peripheral Giant Cell Granuloma- A Case Report. *Oral Max Path J*. 2013;4(2):408-12.
9. Mansor SM, Al-drobie BF. Clinic pathological and Immunohistochemical Comparison of Peripheral and Central Giant Cell Granuloma of the Jaws Using CD68 and CD 163. *J Res Med Dent Sci.* 2022;10(6):213-8.
10. Mohmod GM, Yas LS. Immunohistochemical Comparison of Peripheral and Central Giant Cell Granuloma Using Matrix Metalloproteinase-9 (Mmp-9). *J Res Med Dent Sci.* 2022;10(6):233-6.
11. Dadmal R, Bhansali A, Indurkar MS. Peripheral Giant Cell Granuloma of Mandible: A Case Report. *Int J Dent Med Sci Res.* 2023;5(5):25-31.

Cite this article: Ghorai L, Bhattacharya M, Banerjee I, Sen S, Shetty R. Peripheral Giant Cell Granuloma in a partially edentulous patient: A case report with literature review. *Int Dent J Stud Res.* 2025;13(1):55-58.