

# Peripheral Giant Cell Granuloma Reaching an Impressive Overgrowth: A Case Report

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**Abstract** Among the commonest reactive lesions of the oral cavity is the peripheral giant cell granuloma. PGCGs rarely exceed 3 cm in their greater dimension. Although they are encountered at any age, the fourth to sixth decades are more frequent. The rarity of this reported case is the impressive size of PGCG and its unusual epidemiological find.

**Keywords** Peripheral Giant Cell Granuloma, Mandibular Overgrowth, Oral Vascular Lesions

depositions were also evident (Figure 3).



**Figure 1.** A clinical picture showing an exophytic erythematous mandibular lesion which measures 3 x 5.5 cm and extends in both buccal and lingual dimensions. Areas of ulceration and hemorrhage can be noticed.

## 1. Introduction

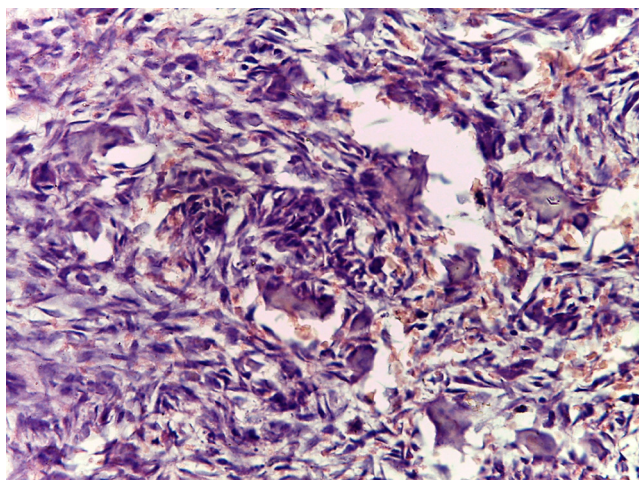
Peripheral giant cell granuloma (PGCG) is a relatively uncommon and unusual hyperplastic connective tissue response to an injury of gingival tissues; representing an exuberant reparative process. The feature that sets this lesion apart from the others is the appearance of multinucleated giant cells, but the reason for their presence remains unknown. Surgical excision is the classical treatment of choice [1].

## 2. Case Presentation

A 24-year-old female manifested an exophytic mandibular erythematous lesion, which measured 3 x 5.5 cm and extended in both buccal and lingual dimensions. Areas of ulceration and hemorrhage were noticed (Figure 1). The patient was neither a smoker nor alcoholic. Being a divorced mother of two daughters, she reported a history of malnutrition secondary to financial issues. The radiographic findings revealed a radiolucent lesion, causing a radicular bone resorption. The lesion pertained entirely to the remaining roots of the left first mandibular molar (Figure 2). Histologically, a confluence of multinucleated giant cells, swimming in a granulation tissue, was remarkable. Metaplastic reparative bone and chronic inflammatory cells were observed. Areas of hemorrhage, and hemosiderin



**Figure 2.** A periapical x-ray film showing a radiolucent lesion, causing a remarkable bone saucerization. The lesion is pertaining to the remaining roots of the left first mandibular molar.



**Figure 3.** (a) Photomicrograph showing the classical histological appearance of PGCG; characterizing a myriad giant cells with artifactual spacing, fibroblasts, and inflammatory infiltrates dashing a granulation background where RBCs and reparative islets are observed. (H&E stained, Original magnifications 40X)

The lesion was treated by surgical excision. There evinced a pulsatile gushing hemorrhage, at the surgical scene: unusual find. The patient had lost approximately 300-400ml of her blood before stitching up the wound site. Fluid therapy was commenced immediately before the discharge of the patient. In 10 month, no evidence of recurrence is observed.

### 3. Discussions

Peripheral giant cell granulomas (PGCGs) typically manifests as a firm, soft, bright nodule, either sessile or pedunculated, with occasional surface ulceration. The color, ranges from dark red to purple or blue. PGCGs are encountered at the interdental papilla, edentulous alveolar margin or marginal gingival level. Secondary ulceration caused by trauma may result in the formation of a fibrin clot over the ulcer. Most of these lesions do not exceed 2 cm in diameter, occur at any age, and tend to show a female predilection (1.5-2:1) [2-5]. Few PGCGs reached a size greater than 5 cm, where factors such as deficient oral hygiene, malnutrition, long-standing irritand or xerostomia coexisted. Accordingly, there appears a close relationship between such predisposing factors and the concomitant imperative role in the lesional growth [6]. PGCGs are usually observed in the mandible more than the maxilla where molar and premolar areas. On removal, PGCGs are highly vascular [7]. PGCGs presumably arise from periodontal ligament or periosteum, and they sporadically induce alveolar bone resorption [8]. The newly secreted collagen acts as a scaffold for infiltration of cells to the site of injury. Moreover, some degradation occurs providing some space for new vasculature to start an angiogenesis [9]. The physiognomic presence of such giant cells, which induce no conspicuous damage to the surrounding structures, accounts for the high clinical vascularity of such lesion since the newly secreted

collagen acts as a scaffold for infiltration of cells with some degradation which should provide some space for new vasculature to start a remarkable angiogenesis [10].

The characteristic histopathological features include a non-encapsulated highly cellular mass with abundant giant cells, inflammation, interstitial hemorrhage, hemosiderin deposits, mature bone or osteoid. Incipient lesions may bleed and induce minor changes in gingival contour but large ones adversely affect normal oral function. Pain is not a common finding, unless they interfere with occlusion, where they may ulcerate and become infected [11].

In contrast to the classical negative appearance of PGCGs, some cases revealed radiographically erosive underlying bone, with a cup-shaped radiolucency [1-3].

In an immunohistochemical and ultrastructural study, Carvalho et al concluded that PGCGs of the jaws are composed mainly of cells of the mononuclear phagocyte system and that Langerhans cells are present in two thirds of the lesions. Vimentin, alpha I-antichymotrypsin and CD68 were expressed in both the mononuclear and multinucleated giant cells. Dendritic mononuclear cells, positive for S-100 protein, were noted in 67.5% of the lesions, whereas lysozyme and leucocyte common antigen were detected in occasional mononuclear cells. Ultrastructural examination showed mononuclear cells with signs of phagocytosis and sometimes interdigitations with similar cells. Others presented non-specific characteristics and the third type exhibited cytoplasmic processes and occasional Birbeck granules. Some multinucleated giant cells showed oval nuclei, abundant mitochondria and granular endoplasmic reticulum whereas others presented with irregular nuclei and a great number of cytoplasmic vacuoles [12].

In the most recent study by Bo Liu et al [13] in situ hybridization was carried out to detect the mRNA expression of the newly identified receptor activator of nuclear factor-kappaB ligand (RANKL) that is shown to be essential in the osteoclastogenesis, its receptor, receptor activator of NF-kappaB (RANK), and its decoy receptor, osteoprotegerin. They concluded that RANKL, OPG and RANK expressed in these lesions may play important roles in the formation of multinucleated giant cells.

A study by Willing et al [14] revealed that the stromal cells secrete a variety of cytokines and differentiation factors, including monocyte chemoattractant protein-1, osteoclast differentiation factor, and macrophage-colony stimulating factor. These molecules were monocyte chemoattractants and are essential for osteoclast differentiation, suggesting that the stromal cell stimulates blood monocyte immigration into tumor tissue and enhances their fusion into osteoclast-like, multinucleated giant cells. Furthermore, the recently identified membrane-bound protein family, a disintegrin and metalloprotease, is considered to play a role in the multinucleation of osteoclasts and macrophage-derived giant cells from mononuclear precursor cells.

Surgical resection, with extensive clearing of the base of

the lesion to avoid relapse, is the mainstay treatment modality. However, intralesional injection of corticosteroid was reported to be also successful [1,2].

#### 4. Conclusions

The peripheral giant cell granuloma can reach a massive size in younger population. The lesion has, quite commonly, rich blood supply, and tends to ulcerate on interfering with occlusion.

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