

## PERIPHERAL GIANT CELL GRANULOMA- A CASE REPORT

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### Abstract

The peripheral giant cell granuloma (PGCG) is a benign inflammatory hyperplastic type of lesion of unknown etiology occurring in gingiva or alveolar ridge. It normally presents as a soft tissue purplish-red nodule consisting of multinucleated giant cells in a background of mononuclear stromal cells and extravasated red blood cells. A 75 years old male patient reported with a chief complaint of pain and swelling in lower right back region of mouth. On intra-oral examination the swelling was red, firm and sessile with smooth surface texture. The orthopantomogram (OPG) revealed a well-demarcated radiolucency extending from distal aspect of mandibular canine to mesial aspect of mandibular first molar. The cone beam computed tomography also showed the features suggestive of soft tissue lesion causing cupping resorption of mandible. Excisional biopsy was performed under local anaesthesia and tissue was examined histopathologically. The lesion was diagnosed as PGCG after thorough clinical, radiologic and histopathologic examination.

**Key Words:** Peripheral, Giant cells, cupping resorption

### Introduction

The peripheral giant cell granuloma (PGCG) is an inflammatory hyperplastic type of lesion that probably involves a reactive response in the periosteum, periodontal ligament, and gingiva. It is set apart from other inflammatory hyperplastic lesions by the presence of multinucleated giant cells whose origin is yet undetermined<sup>1</sup>.

PGCG is also known as peripheral giant cell tumor, giant-cell epulis, osteoclastoma, giant cell reparative granuloma, or giant cell hyperplasia<sup>2, 3</sup>. It probably does not represent a true neoplasm but rather a reactive hyperplastic lesion due to local irritation or trauma<sup>4, 5</sup>. The initiating stimulus has been believed to be due to local irritation or trauma, but the cause is not certainly known<sup>6</sup>. Local irritants such as calculus, bacterial plaque, periodontitis, periodontal surgery, ill-fitting dentures, overhanging restorations and tooth extractions are suggested as the etiological

causes<sup>2</sup>. Dental implants can also cause traumatic damage to alveolar mucosa and to the underlying bone and may be predisposing factor for PGCG<sup>7</sup>. Low socioeconomic status of the patients and unfavourable oral hygiene also seem to be predisposing factors to peripheral giant cell granuloma. Recently, Choi reported the association of peripheral giant cell granuloma with hyperparathyroidism secondary to renal failure<sup>8</sup>.

Reactive hyperplastic lesions are categorized to several groups. PGCG is one of the most frequent giant cell lesions of the jaw originating from the connective tissue of the periosteum and the periodontal membrane<sup>3</sup>. Although the lesion may be found in very young children as well as in dentulous or edentulous elderly person, most patients were in fourth to sixth decade of life and the mean age of the patients at the time of diagnosis is typically 38-42 years. It was found that the females were affected twice as frequent as males<sup>9</sup>.

Clinical appearance of PGCGs can present as polyploidy or nodular lesions, primarily bluish red with a smooth shiny or mamillated surface, stalky or sessile base, small and well demarcated<sup>10</sup>. Lesions can become large; some attaining 2 cm. in size<sup>11</sup>. However, there have been reports of masses in excess of 5 cm, where factors such as deficient oral hygiene or xerostomia appear to play an important role in lesion growth<sup>3</sup>.

Radiographic examination generally has no findings, because the lesion is a soft tissue mass<sup>12</sup>. Although the PGCG develops within soft tissue, "cupping" superficial resorption of the underlying alveolar bony crest is sometimes seen. On occasion, it may be difficult to determine whether the mass arose as a peripheral lesion or a central giant cell granuloma eroding through the cortical plate into the gingival soft tissues<sup>11</sup>.

In study of 144 giant cell lesions by Mohajerani et al, PGCG was most common (59.5%) lesions and it was seen more in mandible (60%) and mainly in anterior region (25.3%).<sup>13</sup>

The histological features consist of a nonencapsulated highly cellular mass with abundant multinucleated giant cells dispersed throughout. Chronic inflammatory cells are present, and neutrophils are mainly encountered in the ulcerated base of the lesions. Fibroblasts form the basic element of the peripheral giant cell granuloma<sup>8</sup>.

### **Case Report**

A 75 years old male patient reported with a chief complaint of swelling and pain in lower right back region. The swelling was tender on palpation. The patient has not given history of any systemic illness. A swelling could be appreciated on the right side of the face on extra-oral examination. No other abnormality detected. [Fig- 1]

Intro-oral examination revealed the presence of firm, smooth and sessile swelling, extending from distal aspect of mandibular canine to mesial aspect of mandibular first molar obliterating the mandibular buccal vestibule. The superior surface of the lesion  
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was bright red and ulcerated. The dimensions of the lesion were 3.5\*3\*2 centimetres. A small swelling was also associated with the large swelling in relation to the canine. The dimensions of the small swelling were 1\*1\*1 centimetres. The surface of this swelling was also smooth. Intra-oral examination of the patient also showed presence of multiple root stumps and bad oral hygiene with plaque and calculus deposits. [Fig- 2]

The (OPG) of the patient shows a well-demarcated oval radiolucency extending from distal aspect of mandibular canine to mesial aspect of mandibular first molar with root stump of mandibular first premolar. Multiple root stumps of other teeth can also be seen. Extensive and generalized bone loss is evident. [Fig- 3]

The cone beam computed tomography (CBCT) reveals soft tissue encapsulated exophytic growth originating from a well defined osseous defect in the right mandible measuring 3.30\*2.65 centimetres in greatest dimensions. The features were suggestive of soft tissue lesion causing cupping resorption of mandible. [Fig- 4]

The lesion was excised surgically. Macroscopically the lesion was round and well encapsulated with smooth surface texture. [Fig- 5] Microscopically the hematoxylin and eosin stained section shows parakeratotic stratified squamous epithelium overlying connective tissue stroma. The epithelium is hyperplastic and shows connective tissue entrapment at places. The lesional connective tissue is separated by a thick band of normal connective tissue. The lesional connective tissue is fibrocellular in nature and shows presence of chronic inflammatory cells, numerous small and large endothelially lined blood vessels, fibroblasts, and bundles of collagen fibers. The lesion tissue is composed of numerous multinucleated giant cells. Under higher magnification the giant cells are showing 8-25 nuclei and are scattered throughout the cytoplasm. The giant cells are located near the blood vessels. [Fig- 6,7]



Fig -1 Swelling on the right side of the face



Fig -2 A Firm, smooth and sessile swelling, extending from distal aspect of mandibular canine to mesial aspect of mandibular first molar.



Fig - 3The orthopantomogram of the patient shows a well-demarcated oval radiolucency extending from distal aspect of mandibular canine to mesial aspect of mandibular first molar with root stump of mandibular first premolar.

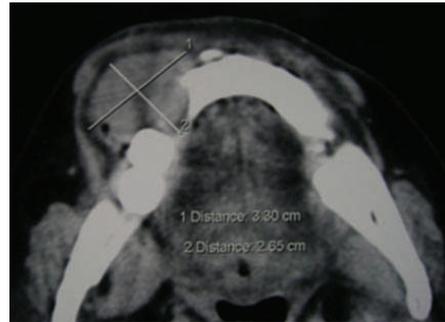


Fig -4 The cone beam computed tomography reveals soft tissue encapsulated exophytic growth originating from a well defined osseous defect in the right mandible measuring 3.30\*2.65 cm in greatest dimensions.



Fig -5 Surgically excised round and well encapsulated lesion with smooth surface texture.

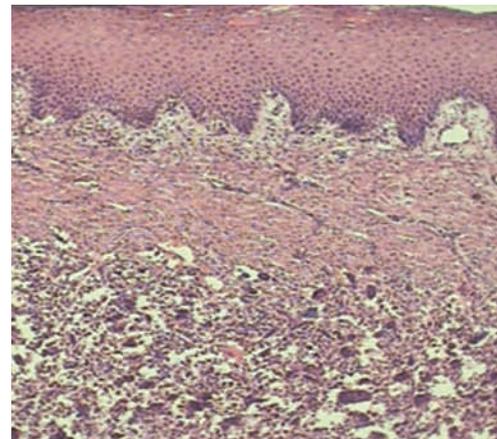


Fig - 6 Hematoxylin and eosin stained section shows parakeratotic stratified squamous epithelium overlying connective tissue stroma. . The lesional connective tissue is fibrocellular in nature and shows presence of chronic inflammatory cells, numerous small and large endothelially lined blood vessels, fibroblasts, bundles of collagen fibers and numerous multinucleated giant cells.

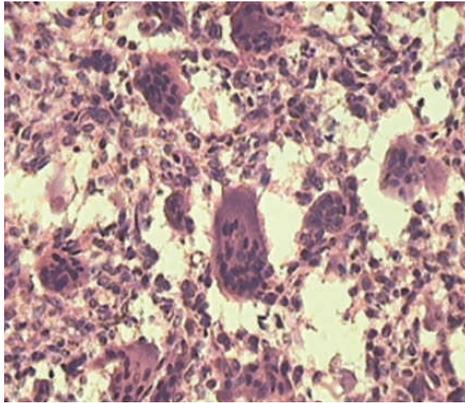


Fig -7 Under higher magnification the giant cells are showing 8-25 nuclei and are scattered throughout the cytoplasm

### Discussion

PGCG is an extrasosseous nodule composed of a proliferation of mononuclear and multinucleated giant cells with an associated prominent vascularity found on gingiva or alveolar ridge<sup>14</sup>.

From a clinical perspective, PCGC is the most common giant cell lesion in both jaws. It occurs as a reaction to local stimulus or trauma and has a tumor like growth. In most cases, a history of tooth extraction is mentioned. This lesion can be seen only in gingiva or edentulous alveolar ridge<sup>13</sup>.

The aetiology and nature of PGCG still remains undecided. In the past, several hypotheses had been proposed to explain the nature of multinucleated giant cells including the explanation that they were osteoclasts left from physiological resorption of teeth or reaction to injury to periosteum. There is strong evidence that these cells are osteoclasts as they have been shown to possess receptors for calcitonin and were able to excavate bone in vitro<sup>11</sup>.

In a study of 123 cases of PGCG by Niloofar Shadman et al mean age of patient was found to be 33 years (age range 6-75years). Out of 123 patients, 52.8% were females and 47.2% were males. PGCG was seen in the mandible (64.6%) more than in the maxilla (35.3%) and in the anterior region "canine to canine region" (57.7%) more than in the posterior region "first premolar to back" (42.35%)<sup>3</sup>.

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Histologically, PGCG is identified as a non-encapsulated mass of tissue compiled of a reticular and fibrillar connective tissue stroma containing profuse young connective tissue cells of ovoid or fusiform shape, and multinucleated giant cells. The microscopic appearance of PGCG is distinctive mainly due to the large number of multinucleated giant cells that are disseminated in the connective tissue stroma<sup>10</sup>. The examination of giant cells reveals an abundance of cell organelles, especially mitochondria. Apart from typical stromal cells, such as fibroblasts, macrophages, and mast cells, clusters of stromal "light" cells were often found with an intimate relation between their cell membranes<sup>15</sup>.

Immunohistochemical and ultrastructural results suggest 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<sup>16</sup>.

Recommended management of PGCG aims at elimination of the entire base of the growth accompanied by eliminating any local irritating factors, as was followed in our case. After complete clinical removal of PGCG recurrence occurs in about 10% of cases, and may result in an esthetic and functional soft tissue defect<sup>17</sup>.

Despite the large number of reported cases of PGCG, clarification of some clinical features is required, and may help formulation and interpretation of future laboratory-based research into this poorly understood lesion<sup>18</sup>.

### Conclusion

The PGCG is the most common giant cell lesion which can attain a large size and may follow an aggressive course so early and definitive diagnosis of the lesion on the basis of history clinical radiographic and histopathological examination allows conservative management with minimal risk to adjacent hard tissue.

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