

CASE REPORT



Central giant cell granuloma: A case report

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Abstract

Central giant cell granuloma (CGCG) is an uncommon, benign, and proliferative lesion of the jaw with an unknown etiology. It is considered widely to be a non-neoplastic lesion. The actual etiology of CGCG is still unclear, although inflammation, hemorrhage, and local trauma have all been suggested. The incidence in the general population is very low, and patients are generally younger than 30 years. The biologic behavior of CGCG of the jaw ranges from quiescent to aggressive with destructive expansion. Here, we report a case of GCG in a 29-year-old male patient.

Keywords: Aggressive jaw lesion, Giant cell lesion, Histopathological, Diagnosis, Radiographic feature

Introduction

Central giant cell granuloma (CGCG) is a benign, proliferative, intraosseous, and non-odontogenic lesion of unknown etiology. The term giant cell reparative granuloma (GCRG) was first used by Jaffe in 1953, to distinguish these lesions from giant cell tumor of long bones.^[1-3] The nature of this lesion is controversial; three competing theories prevailing is being reactive, a developmental anomaly, or benign neoplasm.^[4] Neville *et al.* considered this entity to be a nonneoplastic lesion and the World Health Organization also classifies it as a bone-related lesion and not a tumor, although its clinical behavior and radiographic features often are those associated with a benign tumor.^[5] According to the World Health Organization 1992 classification, CGCG is defined as “an intraosseous lesion consisting of more or less fibrous tissue containing multiple foci of hemorrhage, aggregates of multinucleated giant cells, some amount of trabeculae of woven bone forming within the septa of more mature fibrous tissue that may traverse the lesion.”^[5]

Case Report

A 29-year-old male patient came to the department of oral medicine and radiology with a complaint of swelling on the lower left back tooth region for 3 months [Figure 1]. History revealed that the patient had pain on that same region which subsided after taking medication. Swelling was gradual in onset

and increased till the present size with numbness (paresthesia in the lower lip). The patient’s medical, dental, and family histories were non-contributory.

The patient had a habit of chewing gutkha 4–5 packets/day for 4 years.

On examination, a diffuse ill-defined swelling was seen on the left middle and lower third of the face measuring approximately 5x6 cm in size, extending anteroposteriorly from the left commissure of the mouth to 2 cm before the earlobe and superoinferiorly from the infraorbital margin to the lower border of the mandible. On palpation, the swelling was tender and bony hard in consistency. Submandibular lymph nodes were not palpable. Intraorally, the presence of well-defined swelling on the lower left vestibule and buccal mucosa was seen, which was ovoid in shape, with buccal cortical expansion and mild lingual expansion, measuring approximately 6 × 5 cm in size, extending buccally from distal of 32 to distal of 37 and lingually from the mesial of 32 to distal of 35 with widening in the middle buccal area showing “egg-shell cracking” [Figure 2]. On palpation, it was tender and bony hard in consistency. Based on the clinical presentation, a provisional diagnosis of ameloblastoma was given. CGCG, aneurysmal bone cyst, and odontogenic keratocyst (OKC) were considered as differential diagnosis.

The orthopantomogram [Figure 3] showed a single radiolucent lesion in the left mandibular body extending from 33 to 37, ovoid is shape, well-defined periphery with sclerotic border, measuring about 5 × 4 cm in size with multiplanar root



Figure 1: Profile picture of the patient



Figure 2: Intraoral picture showing well-defined swelling on the lower left vestibule and buccal mucosa

resorption in relation to 34, 35, and 36 with no displacement of teeth and there was compression of the inferior alveolar nerve pushing downwards. A radiographical provisional diagnosis of unicystic ameloblastoma was given. CGCG, OKC, and aneurysmal bone cyst were considered as differential diagnosis. Incision biopsy of the lesion was done.

The H & E stained soft-tissue section showed devoid of epithelium. The connective tissue stroma shows numerous multinucleated giant cells in the fibrous background. The nuclei vary from 10 to 25 in numbers, giant cells are haphazardly arranged and few are also seen around the blood vessels. The presence of inflammatory infiltrates predominantly lymphocytes and plasma cells along with areas of hemorrhage. A final diagnosis of CGCG was given [Figures 4 and 5].

Discussion

Jaffe initially described that the term “reparative GCCG” to describe lesions that he believed was a response to an intraosseous traumatic

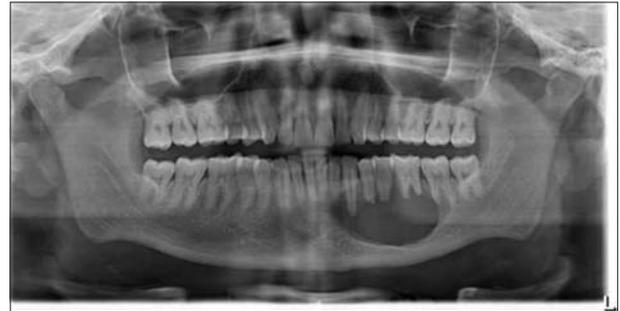


Figure 3: Panoramic radiograph showing a single radiolucent lesion in the left mandibular canine – 2nd molar region with multiplanar root resorption in relation to 34, 35, and 36 compressing the inferior alveolar nerve downwards

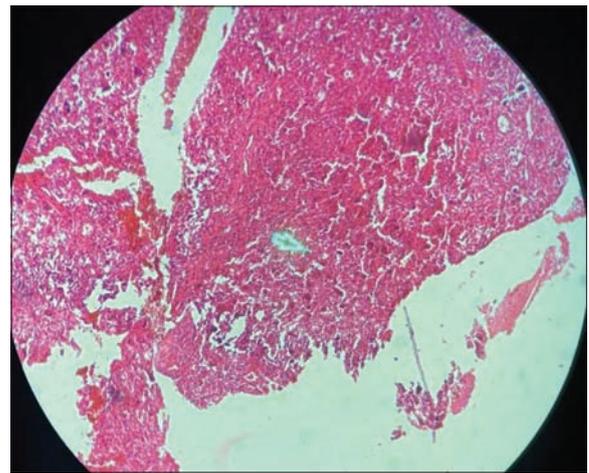


Figure 4: Low-power photomicrograph multinucleated giant cells (×10)

hemorrhage of the jaw.^[6,7] The incidence of CGCG in the general population is estimated to be 0.0001% with 60% of cases occurring before the age of 30. Gender predilection reports are variable, but the majority of them occur in females with a female: male ratio 2:1. It has been noted that the development of CGCG occasionally coincides with the onset of pregnancy or menarche.^[7]

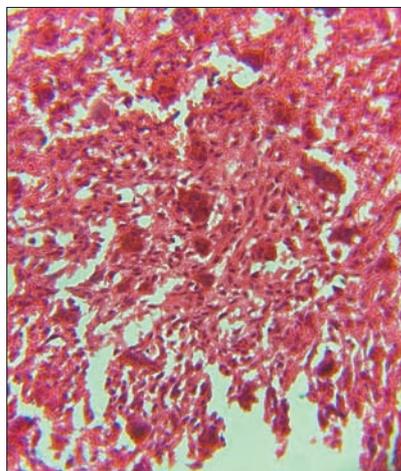
CGCG is more prevalent in the anterior than the posterior jaws, often crossing the midline (50%), and the mandible is more commonly affected than the maxilla and confined to the tooth-bearing areas of the jaws.^[8] In this case, the left side of the mandible was affected.

CGCG has a variable clinical behavior from asymptomatic slow-growing edema to painful, aggressive lesion causing bone lysis, root resorption, and tooth displacement.^[8] The clinical findings in this case included a painful and rapidly increasing swelling of the mandible that extended from the 34 region to the 37 region on the left side.

Most authors rely on Chounlog *et al.*'s division, who distinguish two types of CGCG – aggressive and non-

Table 1: Differentiating features between nonaggressive and aggressive central giant cell granuloma

Features	Aggressive	Non-aggressive
Growth rate	Rapid	Slow
Pain	Usually associated with pain	Pain may or may not present
Paresthesia	Present	Absent
Radiographic feature	Severe root resorption, cortical expansion, and perforation cortical	Minimal expansion
Histological features	Larger fractional surface area occupied by larger giant cells	Smaller fractional surface area occupied by smaller giant cells
Rate of recurrence	High rate of recurrence	No recurrence

**Figure 5:** High-power photomicrograph showing multinucleated giant cells (×40)

aggressive.^[9] The non-aggressive type refers to cases in which the granuloma grows slowly, often asymptotically. The aggressive type is characterized by increased bone destruction, pain, larger tumor size, its rapid growth, and complications including root resorption, bone perforation, and a high tendency to relapse.^[10]

Conventional two-dimensional radiography is generally the first imaging modality performed in clinical practice. However, it provides limited information regarding the cortical integrity, size, and extension of the lesion, and thus imaging providing more in-depth detail, such as three-dimensional (3D) imaging, is preferred.^[10]

Radiographically, the lesion commonly presents as a solitary radiolucency with a multilocular appearance or, less commonly, a unilocular appearance. Lesions develop twice as often in the mandible with an epicenter anterior to the first molar in young patients, and there is tendency for the epicenter to occur in the posterior aspect of the jaws after the first two decades of life.

In the maxilla, the epicenter is more commonly anterior to the canine. The borders may be well-defined or illdefined and show variable expansion and destruction of the cortical plates.

The internal structure may show granular pattern of calcification which is organized into ill-defined, wispy septa which emanate at right angles to the periphery of the lesion.

Displacement and resorption of teeth are also evident.^[10]

CGCG should be differentiated from OKC, unicystic ameloblastoma, and aneurismal bone cyst (ABC). OKC can be differentiated from CGCG, as it is asymptomatic, occurs 65% in mandibular third molar region, has an epicenter superior to alveolar canal, and presents as a multilocular radiolucency with scalloped borders and high-recurrence rate.^[2,5,10] Unicystic ameloblastoma is asymptomatic, occurs in mandibular third molar region, and radiographically appears unilocular with thinning and expansion of the cortical plates. ABC affects mandible (ramus and molar area) more than the maxilla, is symptomatic, seen in younger age group, and radiographically appears unilocular with thinning, and cortical plate expansion. Clinical and radiographic features are not definitive diagnosis in CGCG.

Two major histological features are diagnostic in CGCG. There is highly cellular, fibroblastic stroma with plump, spindle-shaped cells with high mitotic rate. The multinucleated giant cells are irregularly distributed and are prominent throughout the fibroblastic stroma. Histologically, the features of CGCG are indistinguishable from brown tumor of hyperparathyroidism and giant cell lesions, but biochemical tests such as serum calcium, phosphorus, and alkaline phosphatase can be taken into consideration to rule out these lesions.^[4-6] Based on the clinical, radiographical, and histological features, several groups of investigators have suggested that central giant cell lesions of the jaw may be divided into two categories, aggressive and non-aggressive, and the difference between these two lesions is illustrated below in Table 1.^[5,10]

Conclusion

CGCG is a benign, non-neoplastic proliferative intraosseous lesion of the jaw with an unknown etiology, which is diagnosed during the first two decades of life. CBCT offers more information about lesion extension and cortical wall integrity and aids in diagnosis. Histologically, CGCG is characterized by two characteristic types of cells: Multinucleated giant cells and spindle-shaped stromal cells distributed in a collagenous stroma.

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