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# Aggressive Central Giant Cell Granuloma of the Mandible - A Case Report with Diagnostic Dilemma

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## ABSTRACT

Central giant cell granuloma (CGCG) is an uncommon, intraosseous, osteolytic, bony lesion of the jaw which is predominantly seen under the age of 30 years with female predominance and is common in the mandibular anterior region. The clinical behavior of the CGCG ranges from slow-growing asymptomatic to large-growing symptomatic osteolytic lesions. The etiology of CGCG is debatable, although, local trauma, inflammation, and hemorrhage have been suggested. Here is a presentation of a case report showing aggressiveness of CGCG with rapid growth involving the anterior region of the mandible associated with paresthesia, pain, mobility, cortical perforation, and showing a completely osteolytic nature. It was diagnosed by histopathological examination and immunohistochemistry. This case was treated surgically with no recurrence seen after a one-year follow-up with a good prognosis. Expansile and osteolytic bony lesions in the jaws or any radiolucency more than 2 cm CGCG should take into consideration as a differential diagnosis.

***Keywords:*** Aggressive and non-aggressive lesions, Central giant cell granuloma, Diagnostic dilemma, follow-up, Recurrence

## INTRODUCTION

Central giant cell granuloma (CGCG) is an intraosseous osteolytic lesion that is commonly involved in the mandible with female predominance and it was first described by Jaffe in 1953. Previously it was called central giant cell reparative granuloma to differentiate from giant cell tumors of long bones. (1) World health organization classification of head and neck tumors and international agency for research on cancer Lyon in 2017 defined CGCG as "Central giant cell granuloma (CGCG) is a localized, benign but sometimes aggressive osteolytic lesion of the jaws characterized by osteoclast-type giant cells in the vascular stroma. Clinically and radiographically central giant cell granuloma is a unilocular, slow-growing, asymptomatic, well-defined radiolucency, expansile, without root resorption and advanced lesions are multilocular associated with pain, paresthesia, cortical perforation, root resorption, tooth displacement, involving in perineural tissue considered as aggressive nature which comes under 30% of cases. Our presented case comes under the aggressive behavior of CGCG [2]. The clinical behavior is varying case to case, from non-aggressive to aggressive, symptomatic to asymptomatic, and is sometimes difficult to predict. the etiology of CGCG is still unknown but some factor is considered as a cause including local trauma, inflammation, intraosseous bleeding, and genetic abnormalities, but evidence has not been proven. The radiographic features are also variable. The

lesion appears generally unilocular or multilocular radiolucency and may be ill-defined to well-defined lesion borders and show expansion of cortical perforation [3]. Our presented case was osteolytic with rapid growth with sudden onset appearance and differentiated from other systemic diseases and other giant cell lesions.

## CASE REPORT

A 15-year young female patient reported to our Govt dental hospital with a complaint of pain and loosening of teeth in the lower front teeth region since-15-days. History revealed the swelling was rapidly growing and associated with pain, loosening of teeth, paresthesia, and difficulties in chewing food in the lower anterior region of the jaw. There was no relevant medical history of any systemic diseases or drug allergy, or trauma, and family history was non-contributory. On examination, extra-orally the facial asymmetry was seen with bilaterally submandibular lymph node palpable with tenderness present [Figure - 1a]. Intraorally single, well-defined oval shape swelling, with the size of approximately 5 x 4 cm. According to the Federation Dentaire Internationale (FDI), the lesion is in relation to 34 to 44 regions, with prominent vasculature. The overlying surface texture was mild erythematous in nature. On palpation, the swelling was soft to firm in consistency, tender on palpation, and non-pulsatile. [Figure1b] According to the history and clinical examination our provisional diagnosis was neoplastic pathology.

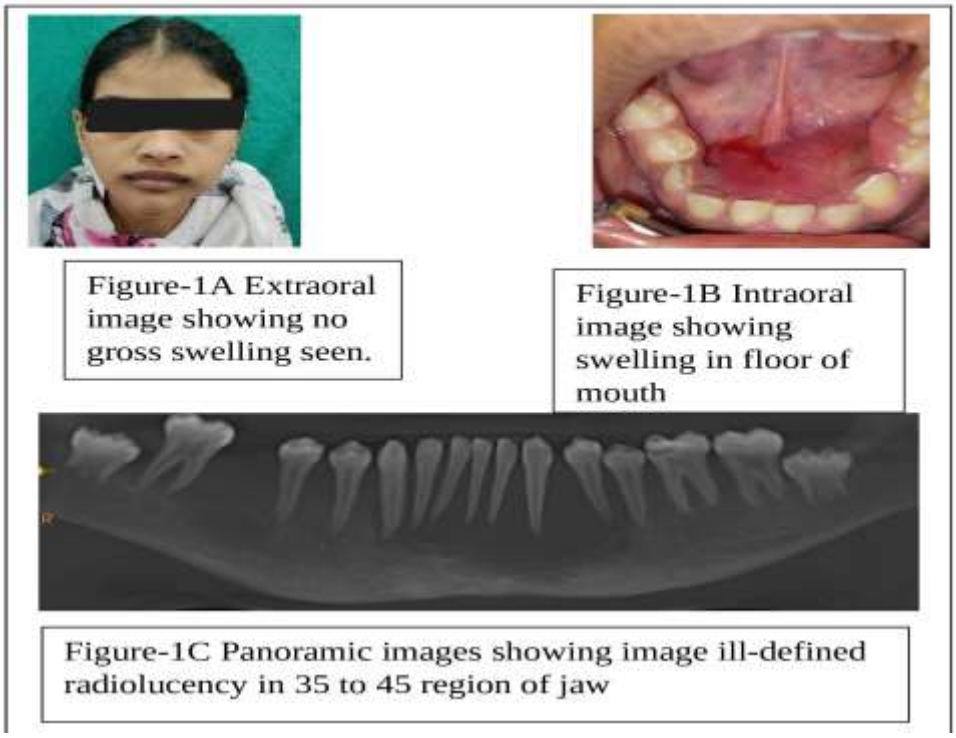

Figure-1A Extraoral image showing no gross swelling seen.

Figure-1B Intraoral image showing swelling in floor of mouth

Figure-1C Panoramic images showing image ill-defined radiolucency in 35 to 45 region of jaw

Routine blood investigations revealed the level of hemoglobin 11.9/grams per deciliter, parathyroid hormone 44/pictograms per milliliter, calcium 10.3/milligrams per deciliter, phosphorus 3.8/milligrams per deciliter, and random blood sugar level of 78/millimoles per liter was completely normal in the range to exclude other systemic diseases and giant cell lesions.

On radiographic examination, the cone-beam computed tomography reveals a panoramic view showing the ill-defined hypodense area extending from 35 to 45 regions and inferiorly to the inferior border of the mandible with loss of cortical bone

and looking floating tooth appearance. The displacement of the inferior alveolar nerve in a downward direction. [Figure-1c] An axial and sagittal view showing an ill-defined hypodense area extending from mesial of 35 to mesial 45 regions with perforation of cortical plates and loss of lamina dura with floating tooth appearance. [Figure-2a] [Figure-2b] In three-dimensionally the lesion is clearly seen as perforated. [Figure-2c]. All these findings of this lesion are suggestive of neoplastic pathology.

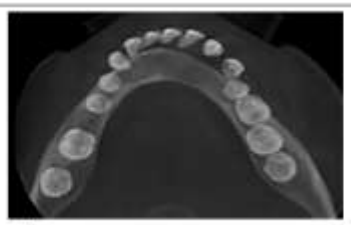

Figure2A -Axial view showing floating tooth appearance with the ill-defined hypodense area.

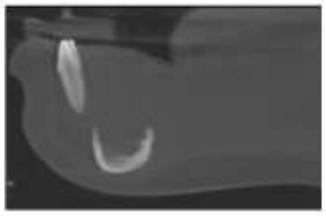

Figure2B – Sagittal view loss of cortical, bone with perforation in lower anterior regions

Figure 2C – Three-dimensional view Shows cortical perforation in the lower anterior region.

Computed tomography facial angiography in-plane and contrast have been done to exclude other vascular lesions manifested in the oral cavity. It showed intense vascularity was noted with predominantly appearing the bilateral lingual arteries which are supplied to front regions. other right and left common carotid arteries were normal. There was no evidence of a focal lesion seen.

On histopathological examination biopsy and immunohistochemistry reveals that mononuclear spindle and polygonal cells admixed with a large number of osteoclast cell-like multinucleated giant cell were noted which suggest central giant cell granuloma. This case was treated successfully by excision of CGCG middle 3rd of the mandible without recurrence after a one-year follow-up.

## DISCUSSION

Correct diagnosis of central giant cell granuloma is quite challenging. CGCG in the craniofacial region is generally asymptomatic slowly growing lesion to rapidly aggressive, numerous tumors are similar to CGCG radiographically and clinically. The unilocular, multilocular, soap bubble and honeycomb appearance with cortical perforation and with and without root resorption, all these features are seen in giant cell lesions including, aneurysmal bone cyst, cherubism, brown tumor of hyperparathyroidism, and also other tumors involving central hemangioma, odontogenic myxoma, arteriovenous malformation, we must be differentiated from all these lesions and considered as a differential diagnosis. But our presented

case shows ill-defined radiolucency with an irregular border with a floating tooth appearance and rapidly grows within a short period which suggests neoplastic pathology and osteomyelitis of the jaw. So, osteosarcoma, Ewing sarcoma, osteomyelitis, and metastasizing tumors must be considered differential diagnosis. CGCG may be differentiated from Odontogenic keratocyst (OKC), ameloblastoma, and an aneurysmal bone cyst. The OKC is generally asymptomatic and occurs 65% in the third molar region with a high recurrence rate and the scalloped border, aneurysmal bone cyst affects the mandible in the molar ramus area, symptomatic and radiographically unilocular with thinning of the cortical plate, Unicystic ameloblastoma is asymptomatic, occurs in mandibular 3rd molar region and radiographically appears unilocular thinning and expansion. [1,3,5] Zhang et al. suggested that aggressive lesions have the highest recurrence. In our presented case the CGCG shows a good prognosis with no recurrence seen after follow-up. [6] Chuong et al in 1986 and Ficarra et al in 1987 classify the CGCG clinically and radiographically as aggressive and non-aggressive lesions. We considered our case to come under an aggressive lesion. (Table 1) [7,8] The traditional treatment of CGCG is surgical excision. CGCG can be managed by surgical and non-surgical methods. A 72% recurrence rate has been reported in aggressive CGCG, especially in the younger age group. The range between recurrence is 11 % to 49% reported. Our presented case came under the remaining 28% non-recurrence.[9] The clinical and radiographical diagnoses do not reliable for the final diagnosis. So, our case was initially confused with neoplastic pathology, arteriovenous malformation, and central hemangioma because radiographically it was mimicking ill-defined radiolucency with a floating tooth appearance and rapidly growing in nature. But if we considered the age of the patient, and the location of the lesion clinically the CGCG can be considered a diagnosis. It was diagnosed by histopathological examination and was confirmed by immunohistochemistry. [9],[10]

Table 1 classification of central giant cell granuloma Chuong et al in 1986 and Ficarra et al in 1987

| CENTRAL GIANT CELL GRANULOMA | AGGRESSIVE | NON-AGGRESSIVE |
|---|---|---|
| Clinical features | Symptomatic associated with pain, paraesthesia, teeth displacement, mobility, facial disfigurement. | Asymptomatic with bone expansion or swelling. 20% cases associated with pain and paraesthesia. |
| Radiographic feature | Ill-defined radiolucency Multilocular or unilocular, Cortical expansion, cortical perforation, root resorption, displacement of teeth, expansion. | Well-defined radiolucency, Unilocular or multilocular with undulating border |
| Duration | Rapidly growing | Slowly growing |
| Age | Commonly in the younger age group | Older age group |
| Recurrence | Highly recurrence | Low recurrence |

## CONCLUSION

A correct early diagnosis and surgical excision with curettage are beneficial and effective in the complete cure of central giant cell granuloma and especially in the aggressive lesion in the younger age group would help in the prevention of recurrent lesions. Expansile and osteolytic bony lesions in the jaws or any radiolucency more than 2 cm CGCG should take into consideration as a differential diagnosis. The diagnosis of CGCG should be based on, clinical, radiographic, and histopathological examination, if possible, immunohisto-chemistry. The rapid clinical, radiographical, and histopathological diagnosis help in the management of osteolytic lesions of the mandible.

### *Declaration by Authors*

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**Conflict of Interest:** The authors declare no conflict of interest.

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