

Central Giant Cell Granuloma of the Posterior Maxilla: A Case Report

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Abstract

Central giant cell granuloma (CGCG), formerly called giant cell reparative granuloma, is a non-neoplastic proliferative lesion of unknown etiology. It occurs most commonly in the mandible. The case reported here resembled a wide variety of conditions that led to a misdiagnosis both on clinical and radiographic examinations but was histopathologically diagnosed as CGCG. We describe a case of CGCG arising from the posterior maxilla to highlight the importance of histopathology in the diagnosis of this enigmatic lesion.

Key words: Central giant cell granuloma, swellings of posterior maxilla.

Introduction

Central giant cell granuloma (CGCG) is an intraosseous lesion consisting of cellular fibrous tissue that contains multiple foci of hemorrhage, aggregations of multinucleated giant cells and occasionally trabeculae of woven bone.¹ CGCG, as described by Jaffe in 1953, is an idiopathic non-neoplastic proliferative lesion.² The term reparative giant cell granuloma at one time was widely accepted, as CGCG was considered primarily to be a local reparative reaction of bone, possibly to intramedullary hemorrhage or trauma. The use of the term reparative has subsequently been discontinued since the lesion represents essentially a destructive process.³

Giant cell granuloma is often confused with giant cell tumor. However, a giant cell tumor can be distinguished based on the fact that it occurs commonly between the ages of 25–40 years, usually involving the long bones and is more aggressive in nature, with frequent recurrence after curettage. Microscopically, the giant cells are osteoclastic and almost uniformly distributed, whereas in giant cell granuloma, foreign body type giant cells with irregular

distribution and vacuolation are seen. The stroma in giant cell granuloma is collagenized or edematous, whereas in giant cell tumor the stroma is made up of plump tumor cells.

A diagnosis of CGCG is made based on histopathology. This statement is substantiated by the case reported here which presented with clinical features leading to clinical differential diagnoses including a wide range of conditions such as radicular cyst, adenomatoid odontogenic tumor (AOT), calcifying epithelial odontogenic cyst (CEOC), desmoplastic ameloblastoma, fibrous dysplasia and a radiographic differential diagnosis of AOT.

Case report

A 16-year-old female patient referred to the Department of Oral Medicine, Tabriz University of Medical Sciences, with a swelling on the right side of the face existing for five months. The swelling was reported to be insidious in onset and had progressed slowly from a small lesion to the present size. The patient also reported that left first molar had

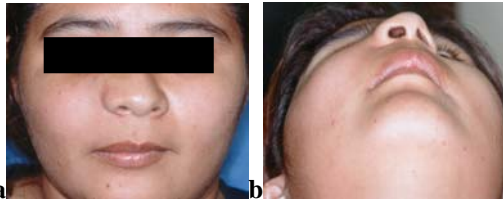


Figure 1. Diffuse swelling on the right side of the face and facial asymmetry (a); obliteration of nasolabial fold (b).



Figure 2. Obliteration of labial sulcus (a); swelling also extended palatally (b).

become mobile one month ago. The swelling was not associated with any systemic symptoms. There was no paraesthesia or nasal discharge. Medical and familial histories were noncontributory. The patient did not present any deleterious oral habits. Extraoral examination revealed a diffuse swelling on the right side of the face causing obliteration of nasolabial fold resulting in facial asymmetry (Figure 1). The overlying skin was normal. The swelling had no localized elevation of temperature. There was no associated lymphadenopathy.

Intraoral examination revealed a fair oral hygiene and a full complement of teeth. There was a swelling in the labial aspect extending from the mesial of upper right central incisor to the distal of upper right second molar, obliterating the labial sulcus (Figure 2a). It had a smooth surface with no evidence of fluctuation on palpation. Swelling also extended palatally and was non-tender and hard on palpation

(Figure 2b). The upper right first and second premolars and first molar showed Grade I mobility (1 mm). There was no discoloration of the teeth. The teeth were non-tender on percussion.

Clinically, there was a swelling of the maxilla involving the labial as well as palatal aspects. Based on the history and clinical examination the following differential diagnoses were continued. Radicular cyst, the most common type of cyst in the jaws arises from teeth (may be associated with trauma) and produces no symptoms unless secondarily infected. The incidence of radicular cyst is greater in the third to sixth decades and has a male predominance. Most of them are found in the maxilla, especially around the incisors and canines. It may cause displacement of adjacent teeth and expansion of jaw. All of the above clinical findings in our case were in favor of radicular cyst.

Adenomatoid odontogenic tumor (AOT) was another diagnosis to be considered. It is an uncommon tumor of odontogenic origin. It most commonly occurs in the second decade and has predilection for females. It is a slow-growing and painless tumor, associated with missing tooth. It most frequently (70%) occurs in the maxilla in the incisor-canine-premolar region. It may cause displacement of adjacent teeth and expansion of jaw. Adenomatoid odontogenic tumor can present as both central and peripheral variants. In our case, the swelling was not associated with embedded tooth. Hence extra-follicular variant of AOT was considered in the differential diagnosis. Fibrous dysplasia was also considered in the differential diagnosis. The monostotic form of fibrous dysplasia most often involves the jaws where the maxilla is commonly affected. It has a predilection for females and is discovered in younger age group. It causes expansion of the affected jaw and displacement of teeth. Calcifying epithelial odontogenic cyst (CEOC) was also considered in the differential diagnoses. It has a wide age distribution at 10–19 years with a mean age of 36 years and second incidence occurs during the seventh decade. Clinically the lesion usually appears as a slow-growing, painless swelling. It has nearly equal distribution between jaws. Most occur anterior to the first molar, especially associated with cuspids and incisors. In most cases it causes expansion of bone and may destroy the cortical plate along with displacement of teeth.



Figure 3. Large generalized radiopacity occupying right maxillary sinus.

An uncommon odontogenic neoplasm (desmoplastic variant of ameloblastoma) was also considered in our case. This lesion has a propensity to occur in the anterior maxilla. The age and gender of patients with this variant does not differ significantly from patients with other types of ameloblastoma. The typical location was consistent with the desmoplastic variant of ameloblastoma. At this stage aneurysmal bone cyst and CGCG were not considered because they are common in the mandible.

Vitality test revealed that maxillary first and second premolars and first molar were non-vital. Waters radiography showed a large generalized radiopacity occupying the right maxillary sinus (Figure 3). Computed tomography (CT) in coronal and axial sections showed a thinning and eroding of right maxillary sinus associated with generalized opacity (Figure 4).

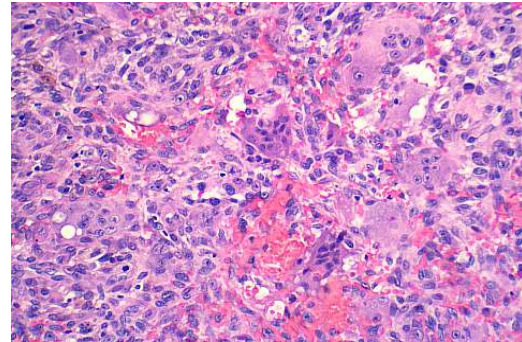


Figure 5. Histopathologic view of CGCG showing multinucleated giant cells.

Destruction of medial wall of maxillary sinus and invasion of lesion to the right nasal cavity were evident. Histopathologic examination revealed numerous multinucleated giant cells distributed in a stroma that was highly cellular comprising both spindle-shaped and round cells and were found mostly in the areas of hemorrhages (Figure 5).

The giant cells were numerous and distributed randomly, the nuclei mainly confined to the center of the cells leaving a clear zone of cytoplasm at the periphery. Ingested RBCs and scanty collagen were also seen. These findings were consistent with diagnosis of CGCG. It is difficult to distinguish this lesion histologically from brown tumor of hyperparathyroidism. Hence serum levels of calcium, phosphorus and alkaline phosphatase were advised which were found to be within the normal limits. Brown tumor of hyperparathyroidism was excluded by demonstrating normal levels of serum calcium, phosphorus and alkaline phosphatase levels, thus establishing the diagnosis of central giant cell granuloma of the posterior maxilla.

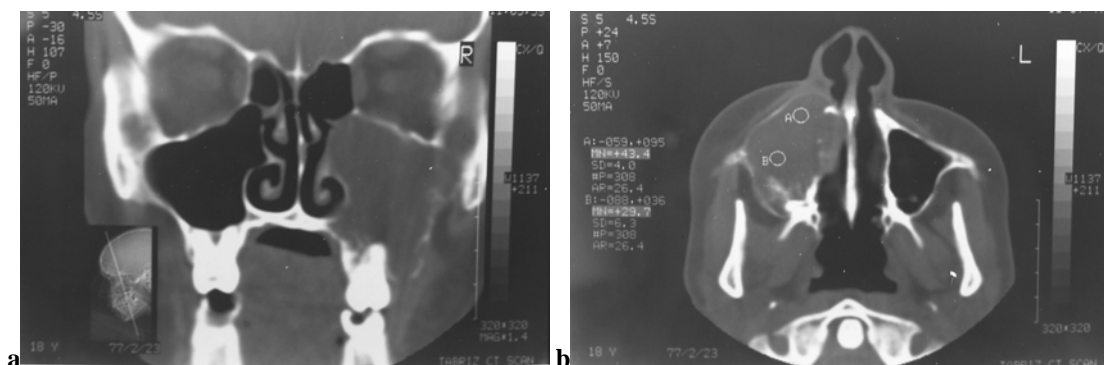


Figure 4. Computed tomography in coronal section showing generalized opacity indicating destruction of medial wall of maxillary sinus (a). Axial section (b) reveals invasion of lesion to the right nasal cavity.

Discussion

Central giant cell granuloma is a non-neoplastic proliferative lesion of unknown etiology. It occurs most commonly in the mandible than in the maxilla. The present case, however, involved the maxilla. Most mandibular lesions occur anterior to first molars and often cross the midline. It strikingly occurs more commonly on the right than left side.⁴ Central giant cell granuloma also occurs in other bones of the facial skeleton and cranial vault. It rarely occurs outside the craniofacial bones, but it has been described in the short tubular bones of hands and feet.⁵ Giant cell granulomas of the jaw bones may be peripheral or central. Peripheral lesions present as pedunculated or sessile lesions on the gingiva while central lesions are endosteal. In most of the cases, females have more predilection than males with a 2:1 ratio.^{6,7} It occurs most commonly in children or young adults.⁸ Trauma has been considered as an important etiologic factor in the initiation of this lesion. The lesions increase by accumulation of tissue which is produced by slow, minute, continuous hemorrhages of multicentric nature due to trauma and some defect in the capillaries.⁶

Association of t(X;4)(q22;q31.3) in the etiology of giant cell granuloma has been reported.⁹ The clinical behavior of CGCG is variable. It ranges from slow-growing, asymptomatic swelling to an aggressive lesion which manifests with pain. The most common presenting sign of CGCG is a painless swelling with noticeable facial asymmetry. Alternatively, the abnormality may be disclosed as a purely incidental finding during radiographic examination of the jaws made for an unrelated purpose. In only about 25% of the cases, the lesion is accompanied by pain. Palpation of the suspect bone area may elicit tenderness. The lesions develop without paresthesia. Teeth in association with the lesion may become mobile but maintain their vitality.

The radiological appearance of CGCG is variable. Usually the lesion appears as a unilocular or multilocular radiolucency. It may be well-defined or ill-defined and shows variable expansion and destruction of the cortical plate. The radiological appearance of the lesion is not pathognomonic and may be confused with that of many other lesions of jaws. The final diagnosis eventually rests on histopathology because the clinical and radiological features are not specific. Central giant cell granuloma

of the jaw usually presents as a painless solitary radiolucent expansion in most of the cases. Some lesions are more destructive with a marked tendency to recur. A more aggressive type of such lesion will require more radical treatment. The recurrence rate is reported to be 13–22%,¹⁰ with most treatment failures manifesting within the first two years of the therapy. The management of CGCG will depend on the clinical and radiographic findings. Generally, curettage of well-defined localized lesions is associated with a low rate of recurrence. In extensive lesions with radiographic evidence of perforation of cortex, a more radical excision is mandatory. In such cases even partial maxillectomy has to be done. The medical management of CGCG as an adjunct to surgery includes treatment with steroids or calcitonin¹¹ which inhibits osteoclastic activity. Interferon-alpha appears useful in the management of aggressive CGCG, presumably due to its anti-angiogenic effects.¹² Bisphosphonates have been administered intravenously in CGCG with promising results.¹³

The clinical behavior of this lesion is quite variable and difficult to predict. Hence we suggest that CGCG should also be considered in the differential diagnosis of the swellings in maxillary posterior area even though it has a marked propensity to occur in the mandibular posterior area.

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